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THE INLAND ARCHITECT AND NEWS RECORD

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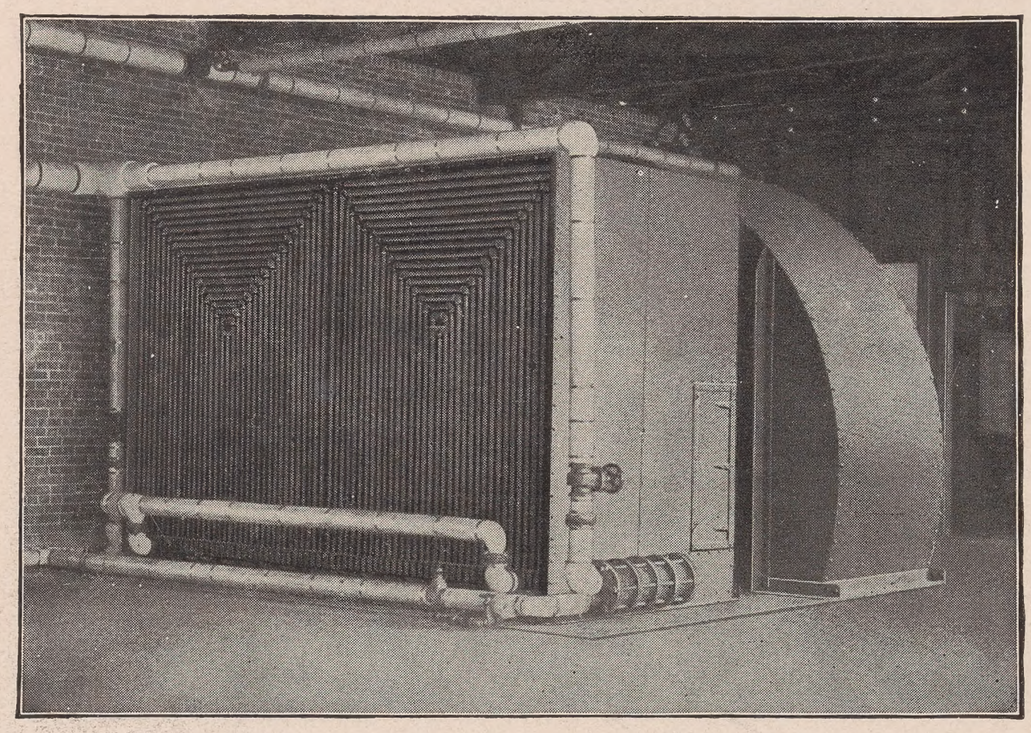

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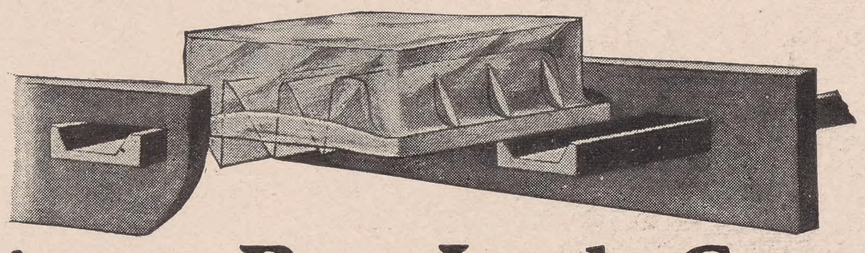

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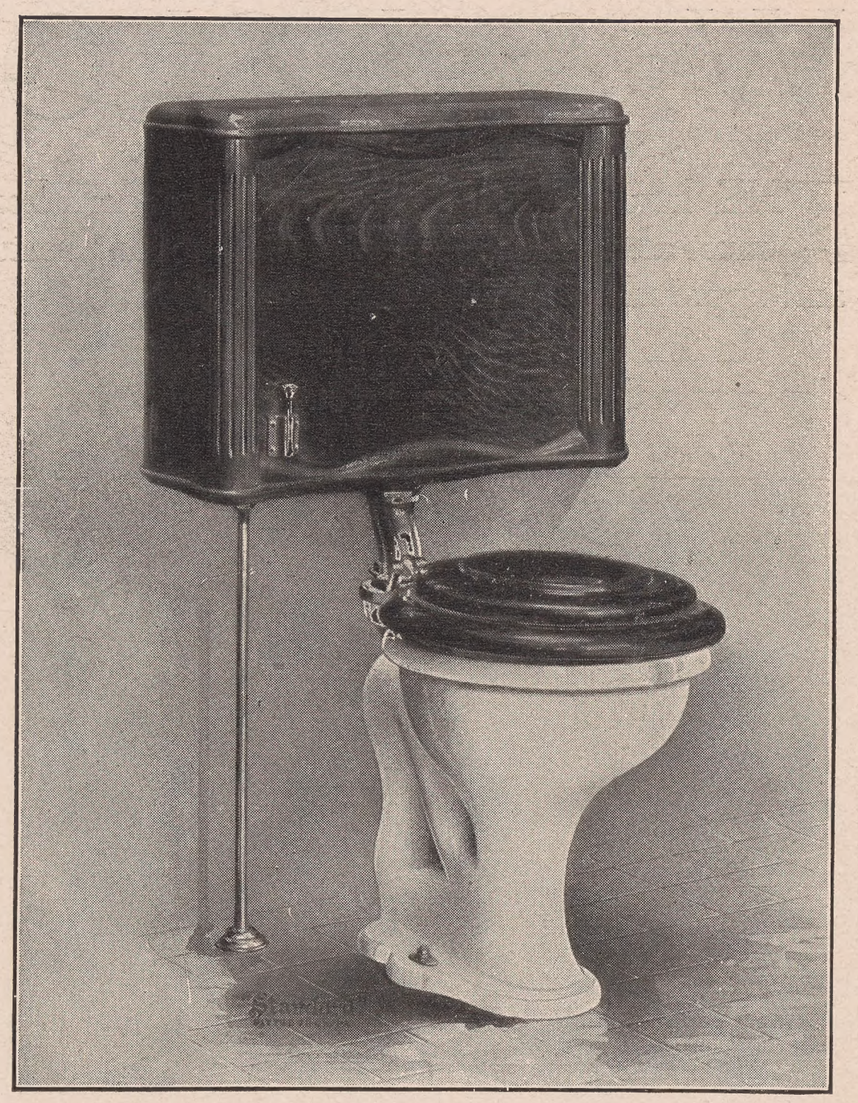

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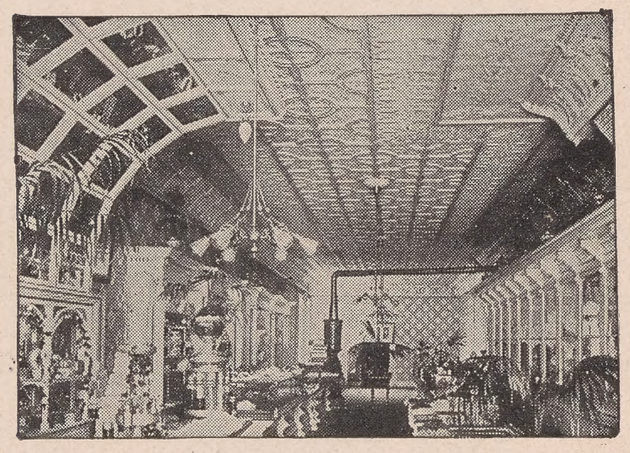

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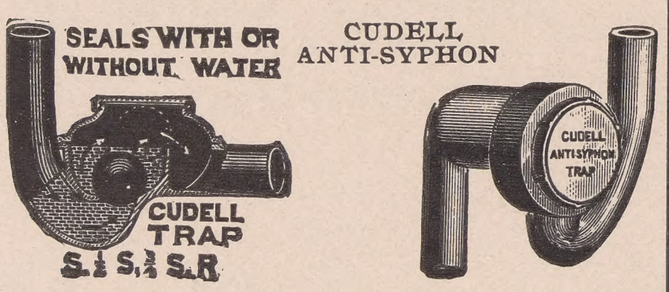

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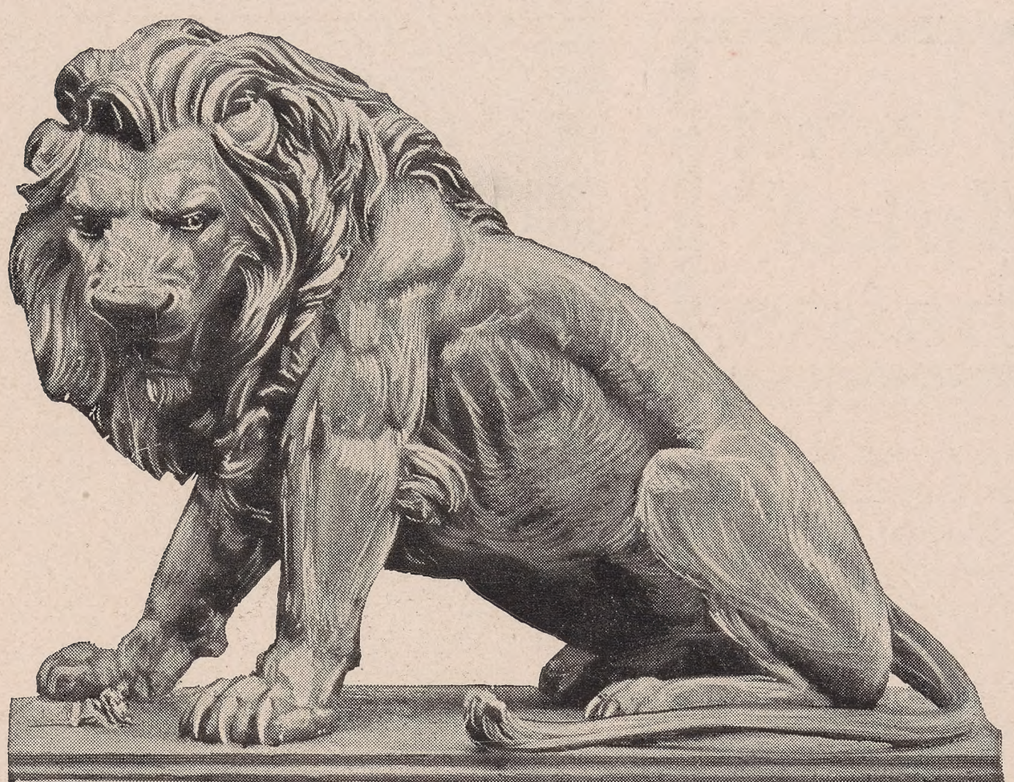

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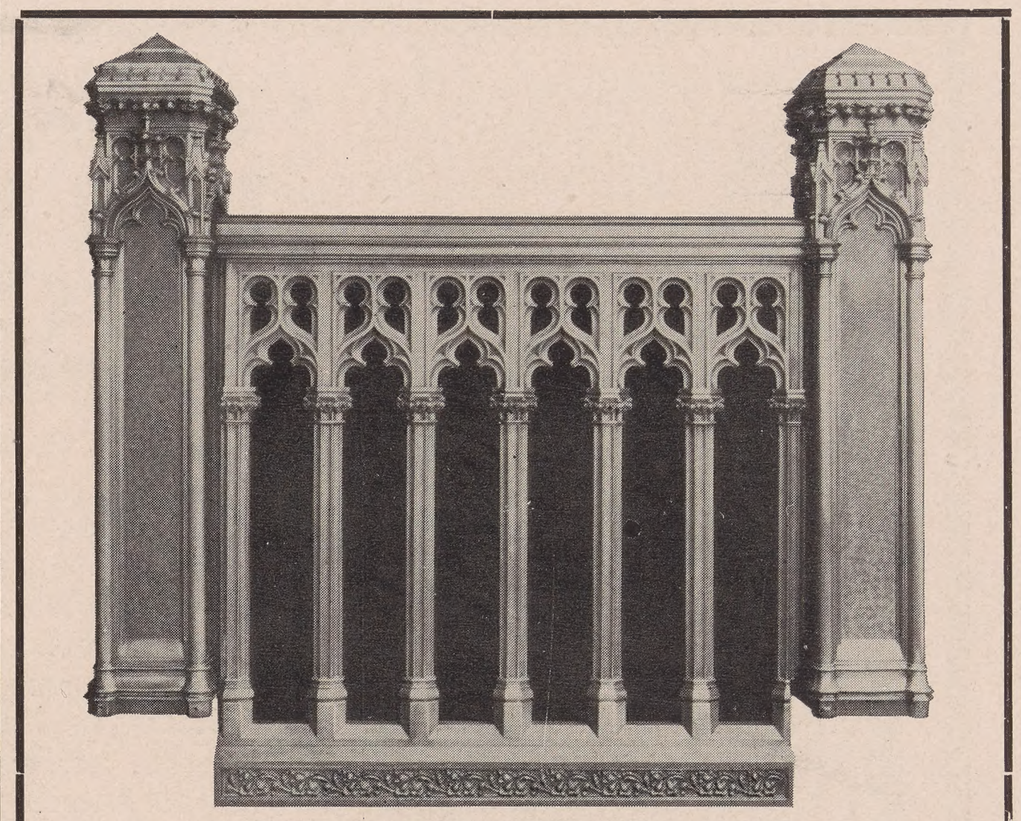

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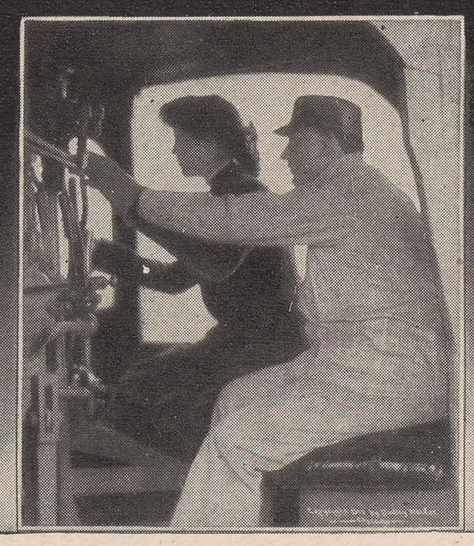

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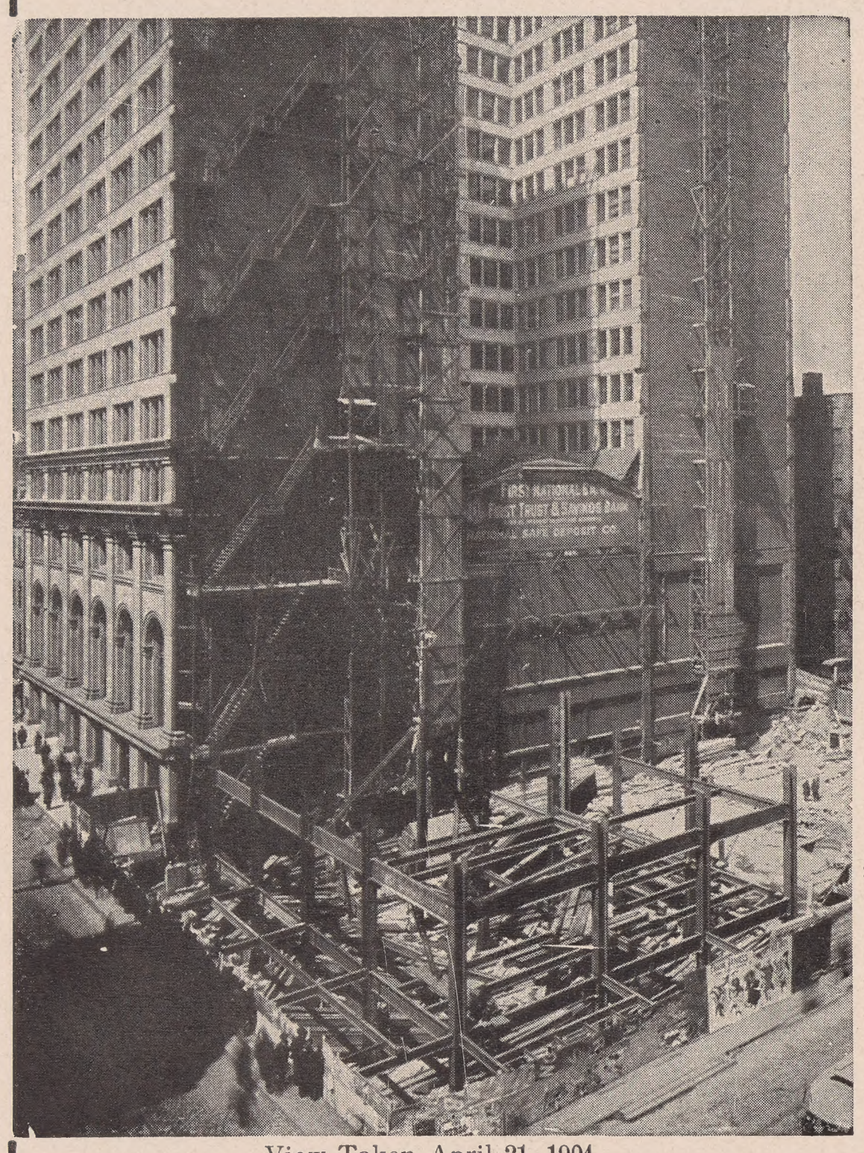

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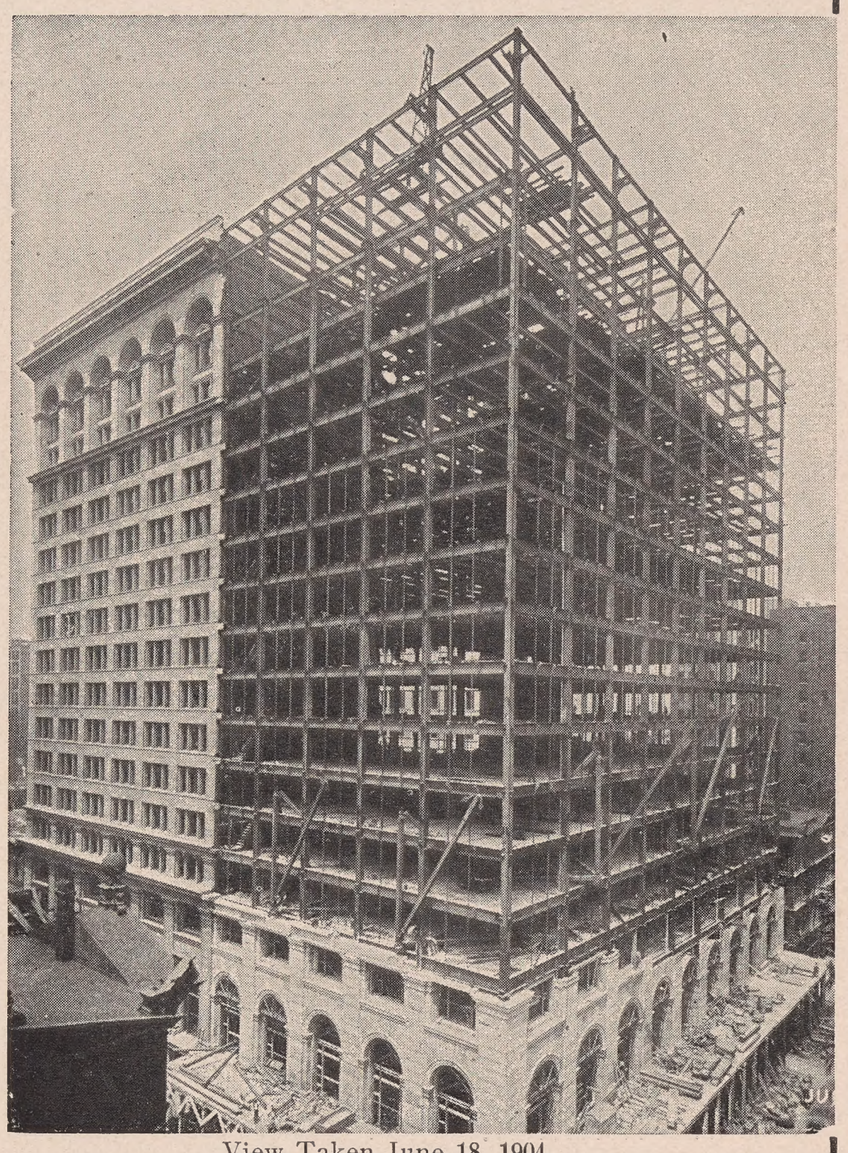

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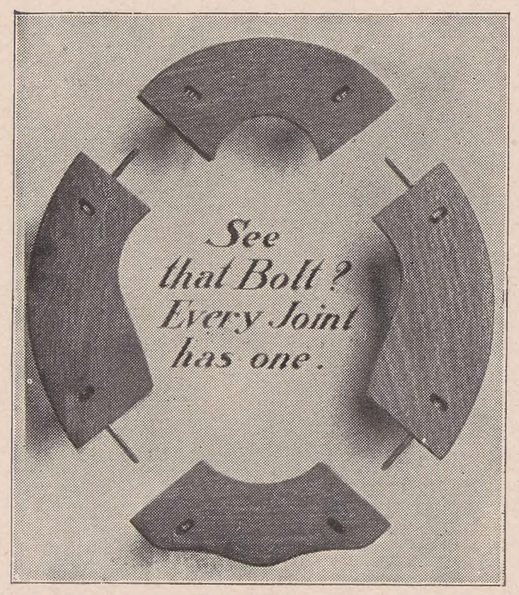

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THE INLAND ARCHITECT AND NEWS RECORD

VOL. XLVI. NOVEMBER, 1905 NO. 4

A Monthly Journal Devoted to

ARCHITECTURE

CONSTRUCTION, DECORATION AND FURNISHING

ISSUED ON THE 15TH OF EACH MONTH

PUBLISHED BY PORTER, TAYLOR & CO.

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NEXT CONVENTION AT NEW YORK, N. Y., 1906.

Why Not Simplify Plumbing Laws.

Arguments in favor of simplifying our plumbing laws have been presented in our columns in a number of articles by Mr Putnam in some detail so far as relates to a repeal of the requirements for the back venting of traps, and we do not recollect having seen any strong presentation of the other side of the case.

So far as we are aware no attempt, based on careful, scientific tests, has ever been made either by private or by public enterprise to defend the complication at present required by the law in the majority of the large cities of this country. The experiments of Hellyer and of Bowditch and Philbrick, which seem to have been largely responsible for the present law, were made about a quarter of a century ago, and recommendations which might have had some excuse at that time are no longer applicable to the present conditions. Greatly improved methods, materials and appliances in plumbing have entirely altered the data. Main stacks of soil and waste pipes are now universally ventilated from top to bottom as was not the case at that time. Fixtures are constructed with better flushing devices. Large drum traps have been found to be secure against siphonage, and back pressure and evaporation without back venting, and other antisiphon traps have been invented which are equally reliable. Means of keeping the air of sewers and drains well aerated and perfectly safe without recourse to back venting have been devised and we know more about the constitution of sewer air and what can be done to render it innocuous than we did in those days. It seems as if some strong answer to Mr. Putnam's advocacy of greater simplicity is considerably overdue and that the burden of proof now lies with those who wish the complication and enormously increased cost to the public to continue. As Mr. Putnam rightly says, if the public are to be put to all this extra expense they have a right to demand not only that the result shall be capable of providing security but also that the simpler method shall not.

Reasons for Condemning Trap Venting.

Mr. Putnam holds that trap venting must be condemned on both counts and gives briefly these reasons for his contention: (1.) That it licks up the water seal by evaporation with a rapidity corresponding to the strength, dryness and high temperature of the ventilating current, and that in practice it often destroys the seal of the common S trap within a fortnight. (2) That its efficacy is easily destroyed by friction created by the walls of the vent pipe and by clogging as by grease, snow or sediment; (3) that it increases the unscoured area of the trap system, making the trap partake of the nature of a cesspool, the vent mouth forming a sediment chamber at or near its crown, and indeed the whole pipe being nothing but a vast elongated cesspool; (4) that it complicates the plumbing leading to dangerous errors called "by passes," and increases the chances of faulty joints where they are least likely to be discovered, because never receiving a water scour; (5) that it increases the danger of freezing the water in the trap, and finally (6), that it greatly increases the cost

and public dread of plumbing. What, on the other hand, are the alleged advantages to offset these very serious and positive objections to trap venting? It is not required to prevent siphonage, because all now admit that anti-siphon traps are more reliable in this respect and are more easily kept clean.

It is no longer required to "aerate the waste pipes," because the modern custom of having all main stacks of piping open both at the top and bottom, and the construction of the modern flushing fixtures, which scour the whole system with their powerful water charges followed by a corresponding volume of pure air from the room, amply fills this need. We agree with Mr. Putnam that it is time this important matter should be settled at once and settled correctly in the interest of the people, and that to do this investigations should be made by impartial commissions appointed by the authorities having charge of the health of our cities. Boards of health or plumbing inspectors should equip themselves with apparatus suitable to test the appliances they allow to be used, that the public may be relieved at once of the burden of back venting if it be found that it is continued solely for the benefit of dealers in piping. We would suggest that the architects, both personally and through the American Institute and its various chapters in the large cities, where they are obliged to charge their clients with this expense, lend their influence to urge the authorities to appoint such expert commissions as may seem to them to be best, for the purpose of making the investigations we have advocated.

Proposed State Law for Fire Protection.

The Inland Architect has several times taken occasion, perhaps unnecessarily, to call its readers' attention to the good work in the way of artistic, municipal and building reforms that have been suggested and so earnestly worked upon (generally successfully) by that earnest reformer, F. W. Fitzpatrick, reforms that, in many cases, have been first exploited in these columns. None of them are of more importance nor can be more far-reaching for ultimate good in their effects than the one that, as executive officer of the International Society of Building Inspectors, he has planned and that first sees the light of day in this issue of the Inland Architect. Our fire losses have indeed reached appalling proportions; our municipalities, the best of them are, to say the least, tardy in their efforts to prevent them. The proposed State legislation is virtually a blanket building ordinance, prescribing the least that can be done in the way of good construction, below which standard no one will be permitted to build within the State. The advantages of its being a uniform law in all the States are obvious. We recommend its most careful perusal to all our readers and further suggest that those directly interested in the subject write Mr. Fitzpatrick, giving him the benefit of any criticisms and suggestions they may have to offer of advantage to the proposed legislation.

Municipal School Buildings.

In school buildings, each city, naturally, has its special problems for solution which determine to a considerable degree the characteristics of the designs and plans of buildings of this class in the individual city. Interesting data and comparisons of school buildings are afforded by the last annual reports, prepared by the schoolhouse departments of Boston, Chicago and St. Louis. In all of these cities, as in New York, the present practice is for the erection of buildings of the first class, fireproof throughout, and fully ejuipped with safety appliances for the occupants. In St. Louis and Boston the exterior walls are of brick with the simplest use of stone for trimmings, a pleasing effect being produced by using brick of mixed colors. The exterior treatment of the Chicago buildings is dignified and attractive. The walls are of brick with a considerable use of stone for pilasters, cornices, and to accent entrances. The new buildings in Boston and Chicago are usually three stories in height. In St. Louis few are above two stories high, with basement wholly above grade, which with the comparatively large lots, gives favorable opportunity for architectural and landscape effects not possible with higher buildings on more restricted sites. In the typical St. Louis plan the rooms are arranged on three sides only of the corridor, which allows good light and ventilation to the corridors and quick egress by stairways located at each end of them. The wardrobes, as in Boston, open only into class rooms which gives the teacher full control over them and also allows ventilating the room through the wardrobe, which in practice has been found very desirable. In the three cities the best results for temperature are obtained by mechanical heating and ventilating, automatically controlled; the plumbing is of the highest sanitary type, and natural slate blackboards are preferred. The rooms and corridors in St. Louis are made attractive by a stenciled frieze.

Interesting Details of School Building.

Some interesting conclusions have been reached in Boston. While sunlight in class-rooms is thought desirable, it is not considered necessary; it is best to concentrate the toilets in the basement instead of distributing them throughout the building; a gymnasium and roof play-ground are favored, especially where the lot is restricted; An economical area of floor plan should not exceed on a floor double the area of the class-rooms; windows, one-fifth of floor area; rooms to be thirteen feet high; corridors eight to ten feet wide; play-grounds, walks and roadways brick paved. All new buildings in Chicago are to have an assembly hall on the first floor, kindergarten, bathroom, manual training room and cooking room; small lots are to give way to enlarged play-grounds; grounds are enclosed with substantial iron fences. In both Chicago and St. Louis portable houses are found useful to relieve congested districts till permanent buildings can be provided. With labor and materials abnormally high the cost of buildings in St. Louis in 1904-05, per pupil, ranged from $124 to $159; in Boston the average is nearly the same; while in Chicago the cost ranges from $123 to $142. In management, the departments in these cities are practically free from political influence. The designing in Chicago and St. Louis is in the hands of the architect of the board of education; in Boston, an architect is selected for each building, and engineers are employed for the heating and electric work. These facts, drawn from varying conditions and covering a wide range of territory, indicate that the school building of the country is proceeding under favorable auspices, that the work averages of a high order, and that there is rapid progress toward all that is best in building and surroundings.

SANITARY ENGINEERING IN THE MODERN OFFICE BUILDING

BY J. PICKERING PUTNAM, ARCHITECT

PART IV

FIGURES 18 to 20 inclusive show some of the different forms of apparatus which have been used in this country for trap testing. One of these, Fig. 19, is an extension or elaboration of actual plumbing work built for ordinary service. The others were erected directly and solely for trap testing. All conform to conditions which may be encountered in ordinary practice.

They all consist in a main soil or waste pipe into which the traps are discharged, and in more or less back vent piping, both straight and bent, to determine the effect of friction in reducing the efficiency of the system.

All demonstrate that back venting, even when the pipes are clean and new and correctly installed in accordance with the law, is unreliable, and that, as a means of protection against siphonage it can not be compared with

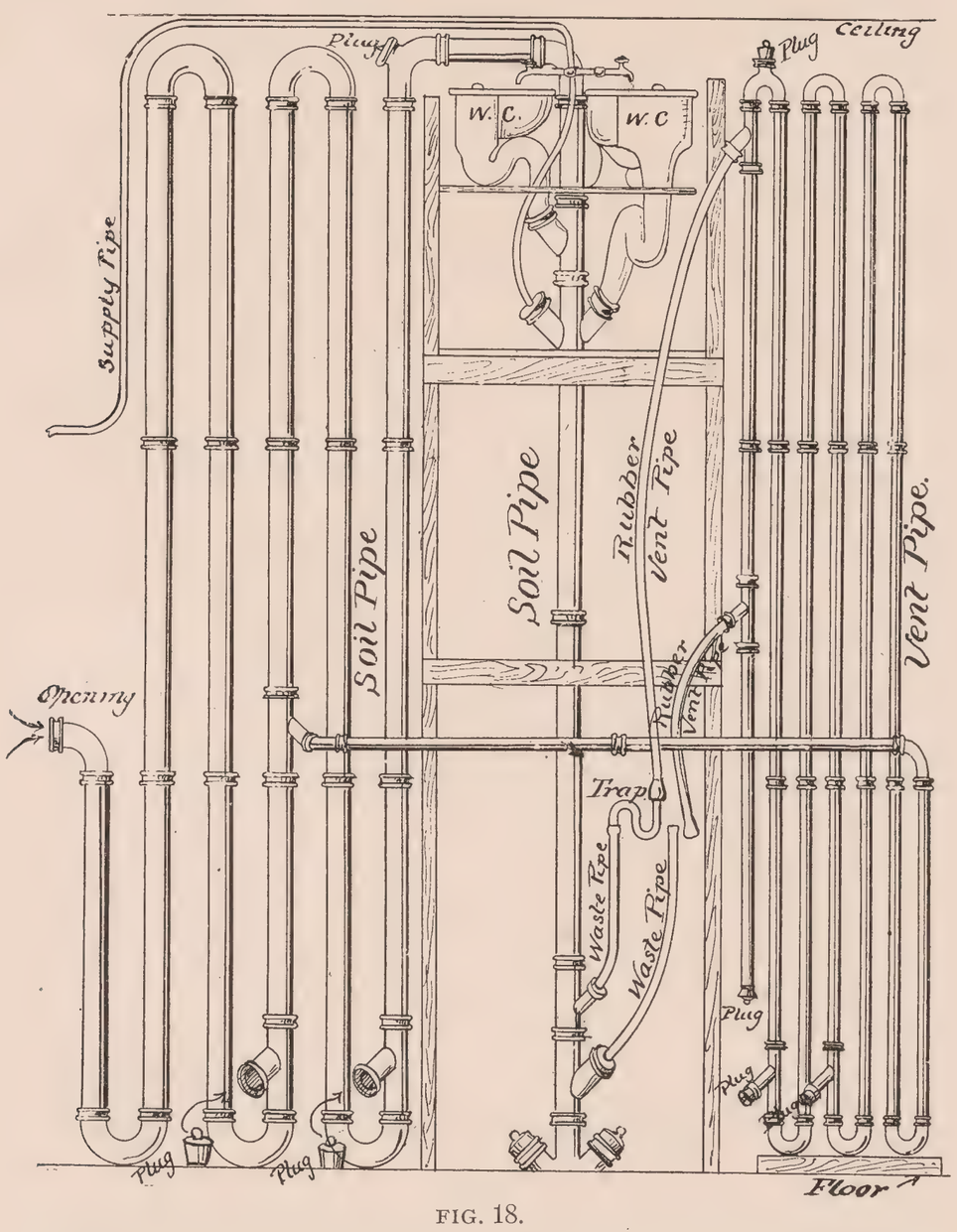


FIG. 18.
APPARATUS USED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

the use of ordinary unvented antisiphon traps in efficiency. If we are to be forced by law to go to the great expense and danger of ventilating every trap, we have a right to demand, first, that the means employed shall actually afford us the security it pretends to, and not fail at the first critical moment, and second, that no other simpler and better means exist for securing the desired result. Our apparatus demonstrates that trap venting must be condemned on both of these counts.

Fig. 18 shows the apparatus used at the Massachusetts Institute of Technology to illustrate a course of lectures on the principles of house drainage, delivered by the writer before the Suffolk District Medical Society and the Boston Society of Architects in 1885. A large number of return bends and a very long stack of piping was put together in order to permit of the greatest possible variety of tests to be made on a single apparatus. But as openings were made in the pipes at various points, we were able to cut off at will one or all of the bends and any part of the length of the pipe. Hence the apparatus could be made to correspond with that in any form of building we desired to imitate. In the high modern office building a much greater length of pipe is encountered than could be represented in any apparatus. But the friction afforded by this great length is in a measure obtained in our apparatus by using the full number of return bends provided.

The soil pipe consisted of ordinary four-inch cast iron hub pipe, put together with putty. Two plunger water closets in common use at the time when these experiments were made were connected with the soil pipe at a platform ten feet above the traps to be tested, and furnished the siphoning discharges. Ordinary two-inch cast iron pipe was used for back venting.

The closets used were the Zane and the Jennings, which were perhaps at that time the most popular in this country. They produced, however, a much severer siphoning strain than any fixture in common use today. Nevertheless the value of thorough water flushing is only now beginning to be understood, and it is certain that the early future will see all fixtures constructed with a view to producing the most powerful possible scour. To effect this they must be constructed, as far as possible, on the principle of the automatic flush tank, and we shall therefore once more encounter the strong siphoning action of the Zane and Jennings closets, and once again the strain on our trap seals will be as great as was provided by this apparatus.

Some years ago, before it became customary to ventilate all the main lines of soil and waste pipes, as all sanitary engineers are agreed in recommending now, there accumulated in the upper part of the pipe system large volumes of dangerous and corrosive gas generated by the decomposition of the heavy deposits in the large soil pipes throughout their entire length. These gases, never liberated as they are now by a constant current of fresh air passing through the main pipes, sometimes formed in such large quantities as to eat through the metal and escape into the house. The water-flushing from the feeble pan closets and restricted basin outlets of that time was quite insufficient to purify the main pipe lines, and serious difficulties arose.

Now, however, the case is very different. All our main pipes are thoroughly ventilated, and a far more liberal flushing is occasioned by the use of modern closets and scientific fixtures of all kinds. This comparatively fresh air of the soil pipes distributes itself by diffusion through the branch wastes, and is forced through by powerful water scour, and gases can no longer collect to any harmful degree.

Consider the case of a branch waste leading from a well constructed wash basin and connected with a well

ventilated soil pipe. Fresh air is constantly passing through the soil pipe, carrying off the products of decomposition as fast as they are formed. If the lavatory be frequently used and properly constructed the branch waste pipe is scoured from end to end and kept very free from foul matter. Fresh air is diffused easily from the soil pipe through this branch as far up as to the trap. If, on the other hand, the fixture is rarely used, the last thin deposit of soap dries up on the sides of the pipe, and what little decomposition goes on then is inappreciable, and the products are removed by diffusion, or if they are absorbed in the water of the trap, what could escape from its surface would, as has been demonstrated by the interesting researches of Carmichael and others, be quite infinitesimal and harmless.

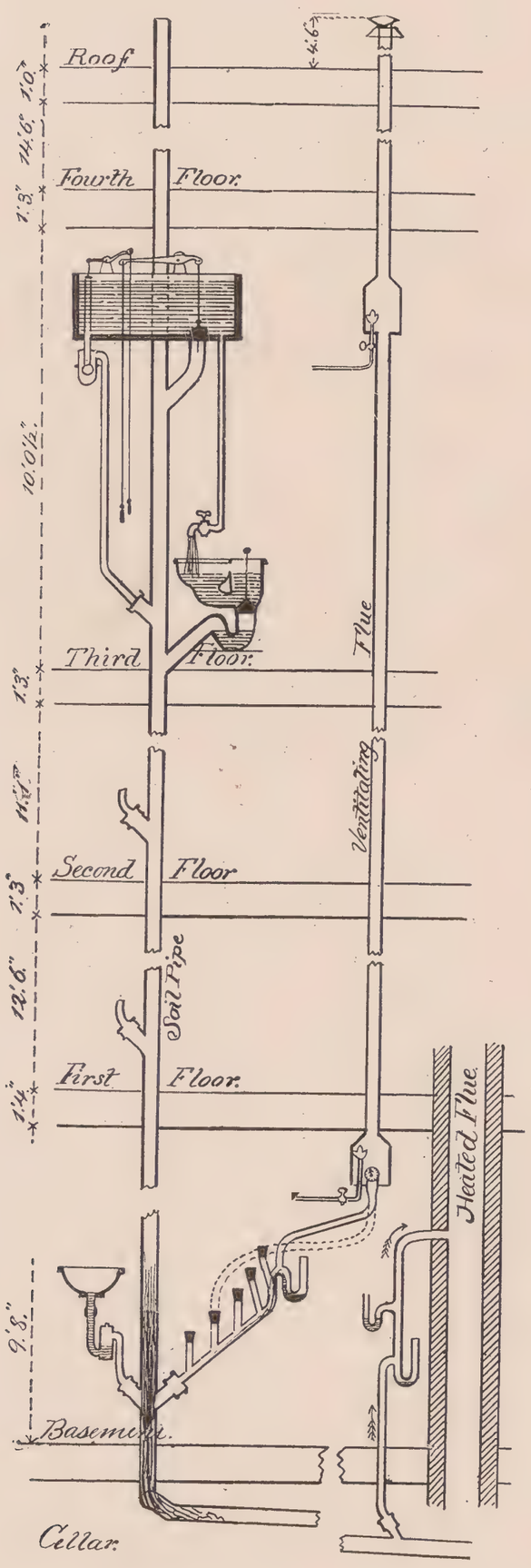


FIG. 19.
APPARATUS USED IN THE EXPERIMENTS FOR THE BOSTON CITY BOARD OF HEALTH.

Air flushing alone is incapable of removing solid impurities from the waste pipe system, but a strong water flush may be relied upon to keep the entire system clean and safe.

When in addition to these considerations of the growing popularity of strong water-flushing through all fixtures we find, in the combined system of sewage disposal, the soil pipes serving more and more as rain water conductors and when we consider the great height of modern office buildings, we shall see that the use of the plunger closets in these old forms of trap testing apparatus does not give a severer strain on the trap seals than we should provide for as a possibility in the plumbing of the near future.

This technology apparatus demonstrated not only that the seal of an ordinary S trap could be destroyed even when guarded by a new and clean vent pipe applied in accordance with the law, but that the vented S offered much less resistance to siphonage than a simple "pot" or "drum" trap of large diameter without any vent pipe at all.

The seal of the vented S was destroyed by the discharge either of both the closets simultaneously or of either one alone. It was destroyed after two or more discharges, even when the length of the vent pipe was reduced to fifteen feet by cutting off the two-inch iron pipe and all its bends altogether. This gives us a shorter vent pipe than we should often be likely to encounter in practice. Hence if the friction produced in this short length of pipe is enough to destroy its effectiveness, anything longer than this would be correspondingly more disastrous.

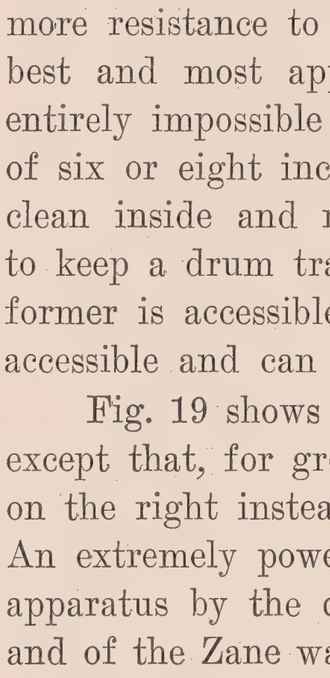


FIG. 20.
APPARATUS USED AT THE NORTH END UNION.

Experiments were made on this apparatus with a partially clogged vent pipe. The supply of air through the vent is then, of course, proportionally retarded, and it affords less and less resistance to siphonage. We have made a great many experiments in this field on a great many different forms of apparatus and on plumbing piping installed for regular use, and have found in all the resistance exactly proportioned, other things being equal, to the size and length of the vent pipe. In our tests for the Boston City Board of Health we used a straight stack of pipes without bends. The siphoning action was equally severe.

In all the different forms of apparatus it has been found that the large unvented drum traps in common use afford vastly more resistance to siphonage than S traps vented in the best and most approved manner. Indeed, it is found entirely impossible to siphon out an unvented drum trap of six or eight inches in diameter so long as it remains clean inside and retains its full capacity. It is easier to keep a drum trap than a vent pipe clean, because the former is accessible and the latter for the most part inaccessible and can not be made otherwise.

Fig. 19 shows the Boston Board of Health apparatus, except that, for greater clearness, the vent pipe is drawn on the right instead of on the left side of the soil pipe. An extremely powerful strain could be produced on this apparatus by the combined discharges of the large tank and of the Zane water closet on the fourth floor.

In order to permit also of a series of experiments on evaporation a galvanized iron ventilation flue was erected by the side of the soil pipe. This flue was heated by gas as shown, and the speed of the induced air current recorded by an anemometer placed in the enlargement in the basement. The branch pipe for testing the traps was provided with several vent openings in order to show the effect of evaporation when the mouth of the vent was placed at varying distances from the crown of the trap.

Further tests in evaporation were made by connecting a second branch waste below the first with a brick flue heated by a stove. On this and on all the other forms of apparatus we have used and illustrated the results have been identical, namely, a clear demonstration that the vented S is incapable of retaining its seal under severe strains, whereas ordinary anti-siphon traps like the common drum trap of large diameter retain their seals indefinitely so long as their waterway is kept open. Fig. 20 shows a simpler form of apparatus erected at the North End Union of Boston to illustrate a course of lectures on sanitary plumbing, delivered by the writer in 1901.

(To be continued.)

SUPPLEMENT TO

THE INLAND ARCHITECT AND NEWS RECORD

DESCRIPTION AND ILLUSTRATION IN DETAIL OF

THE FIRST NATIONAL BANK BUILDING, CHICAGO.

VOL. XLVI. NOVEMBER, 1905 NO. 4

CHICAGO'S MOST MASSIVE AND COSTLY OFFICE BUILDING

D. H. BURNHAM & CO., ARCHITECTS

"Magnitude and order are the essentials of the beautiful in architecture."

A MASSIVE structure of steel and granite looming skyward over 200 feet and covering a large ground area in the heart of Chicago's commercial center. This is the new home of the First National Bank, the great financial institution of the West. It is a marvel of what may be termed American architecture. It combines beauty with utility, strength of foundation and superstructure with power of expression of a great mass in simple lines and magnificent proportions, broken only by horizontal courses essential in the composition. There are few decorative features in the facade; its mass gives the impression of beauty and grace. Like a single glistening shaft its fine proportions hold the interest and command the admiration. The human mind worships grandeur and this is one of the secrets of the power of the old masters over all generations. They were right in principle and practiced the truth. Masters of today will be equally honored if they but hold to the truth.

To even the average man on the street not architecturally informed, who has not traveled abroad and lingered in the old Italian cities, the exterior of this great building suggests that its interior contains a bank of something more than ordinary extent and he would be disappointed if anything of lesser scale or of proportions unworthy of its exterior were found therein. How much more than this is suggested to the imagination of the traveled and trained architect by this great exterior, for the grandeur and dignity is there even though commerce has set her mark thereon, and has very properly been given expression.

Its designer once said that in architecture the biggest thing was the best thing to do—and here he did it nobly—inside and out, and all in one style, on one scale. It is a conception complete. The imagination, the eye and the mind are satisfied and it all seems so simple, logical and natural that the untrained amateur, even the untrained architect, is apt to overlook the fact that the element of simplicity is the most difficult to express. He is likely to overlook the reserve, the unselfish sinking of individual personality, the love of the work above self, the omitting of all petty detail and trivialities that a vain or less great mind would have used by which to express himself. Here the biggest thing (as in the exterior) was the best thing to do and the best thing was done.

THE INTERIOR.

One enters the building with the exterior in his mind, prepared to find just what is there. The three wide entrances invite one from the sidewalk into the hall of the building. Most logically the hall comes out to meet the street and the street seems to be carried into the hall; here the grand Italian staircase seems to greet and to invite on to the bank above. It is so well designed and proportioned that one is on the threshhold of the bank before realizing that the ascent has been made. The rather low one-story hall has been transformed by the great open well of the staircase into a lofty hall of reception with a balustrade and balcony around the stairway.

There is a nobility in the conception; a palatial air about that hall and grand staircase which reminds the traveled and educated architectural mind of the palaces of Naples, of the great Roman and Florentine palaces.

The steps, the balustrade, the panelled walls, the coffered ceiling, the great chandelier, the grilles, the design of the marble floor are all in scale and harmony and thoroughly Italian in the best sense, and almost Roman in its dignity. White marble was the material in which the artist designer chose to express himself. With this the floor contrasts finely; its inlays of Sienna, Verde antique, Numidian marbles in panels, lozenges, discs and bands, in the white ground. Turning and looking down the stairway or upward at the exquisitely panelled ceiling in white and gold, or through the arched opening toward the street, the vaulted gray and gold ceiling of the president's room showing in the view, or gazing at the corner arches and stairs to the directors' rooms on the third story, one is well satisfied and turns back to enter the portals of the great banking room, prepared and expectant.

No one could enter here without being much impressed by its vastness, its magnificent scale and proportion. It is more than impressive, it is grand. It might be the cella of a Greek temple, with its galleries, the ceiling away above where its height allows of an effect of atmosphere such as only very great enclosed spaces have. The designer intended to create something grand without being grandiose and so favored Italian in the treatment. While it has all the classic scale and spirit, it is much more true to the exterior and to its purpose and more natural than the use of any of the classic orders would have been, and fits its time and place and purpose nobly.

In this hall or court of reception again is invitation expressed, it is all left as a great open space for the public, unbroken inside its great square and sided colonnade by any commercial uses or obstruction, while desks, seats and other evidences of its dedication to the public convenience expresses its purpose. Like the atrium or cella of the Roman or Grecian palace is this great hall, around which are arranged the various departments of

the institution; at the sides low counters of marble, without screens of any kind above, admit of a fine view from wall to wall, between the great piers and arches. There are vistas of magnificent distance as one stands inside the doors and looks north, south and west, or up to the white and gold and gray ceiling with its central light of metal and glass amply lighting the whole space and surfaces below.

The whole of this noble court is of white marble. Beyond the court on three sides are loggias containing the banking rooms at the north and south and west ends, all similarly treated. These contain other banking departments which had of necessity to be enclosed with metal screens of fine design, but the height of the ceiling is so great that they only count as furniture for the immense room. Bower-barffed iron and bronze above white marble form counters and screens with mahogany for furniture and fittings. Each side of the central court is marked and formed architecturally by piers, the sides of which are left to form the supports of the semi-circular arches springing from imposts.

The center portion of the piers are absorbed or covered by pilasters which intervene between the arches and rise to terminate as a square pier or column with Corinthian caps gilded and enriched; these support an entablature, above which a trellis of metal with ground glass fillings and supporting ribs suggests finely the Italian open air court adapted to our climate and the beauties of its purpose. Between the columns, and supported by the arches, is a mezzanine balustraded gallery, the open space above which thus exposes the thickness of the wall by the upper part of the square shaft and cap and the equally wide soffits of the arches; also the jambs of their supporting piers give a recurrence of this massiveness of wall. On the other side of these piers back of large pilasters and between the arches on the north, south and west sides of the central court minor pilasters run up and support the soffits and ceiling of the loggias which surround the court and contain the bank's working space; these loggia pilasters are also supported on pedestals. The arch jambs run to a low base above the floor, thus intervening between the different sized pilasters on each side of the piers. The soft gray, white and gold of the coffered ceiling and the panels on the walls of the loggias contrast finely with the white of the marble piers, pilasters, arches and counter fronts and the floor with the white marble and its Verde antique diamonds set in at intervals.

JOHN B. FORGAN
President First National Bank

The president's room fills the space between the outer walls on Dearborn street and the end of the gallery of the stair hall where the arched glazed opening gives a vista of this room's fine groined Italian ceiling. This is a fine room and consists practically of three parts, of which mahogany pilasters and piers form the vertical divisions, and at the same time support the three bays of groined ceiling, arched and vaulted with wide Italian round ribs of fruit and leaves banded, and tied by ornament at the intersection of the groins. The wall is wainscoted in mahogany between the pilasters. The ceiling is decorated in grays and olives in the spandrels, and in soffits of the hoods of vaults. The ribs are decorated and finished in gold with amber or Sienna rubbed into the recessed portions. A recurrence of the gold in decoration on the olive and gray ceiling ties the whole together. The mantel at end of room is effective, as are also the doorways and the pedimented treatment in the one alcove and windows in the three arches on the street front of this room. This room has great height and dignity and is of fine proportion. Three cubes would probably be the definition of its composition, the other one-third of each being groined and vaulted.

The directors' room is lower, which afforded less opportunity for its treatment. The decorators here, as everywhere, have ably assisted the architect, emphasizing the architecture, yet in a quiet, unobtrusive way enriching the projections and with soft grays the recesses and shadows. The walls, however, are not so well treated here and might well have been left as effective background with an almost invisible figure of smaller scale and hardly any variance of colors.

The commercial features of this building are of a high order. They combine the most approved requirements of a great banking house with those of a first-class modern office building. Architecturally the building outranks most of its class. It is a dignified expression upon broad lines of progress in art, combined with a high appreciation of architectural propriety in detail and marks an era of architectural growth in the adaptation of the laws of art to the modern business structure.

INTERIOR DECORATION.

The allegorical paintings for the president's room

are now in readiness for setting. They are most appropriate in design and very artistic in execution, as our illustrations show. The titles are Art, Science, Commerce and Labor, indicating the broad range of the influence of the bank. No business, art, science or labor can be successfully carried on in this day of enterprise without the aid of the bank. It is therefore most fitting that these representations should find their proper niche in this room.

In the ceiling of the directors' room are also two fine mural paintings, entitled "The Proper Use of Money" and "The Wrong Use of Money." These seem also to have found their proper place with the general scheme of color decoration. These mural paintings were all designed and carried out by J. F. Sturdy of Chicago.

The ceiling of the directors' room is divided into three panels, rather oval in form, with strong molded frames, emphasized and connected at the intersection of their extreme diameters with the surrounding cornice and with each other by finely modelled cartouches, very Italian in style. The fine modelling of the relief ornament was executed by McNulty Bros., contractors for all the ornamental plaster work.

In a building of this magnitude and high character there are many interesting problems, not alone in design, but in construction, which require in their satisfactory solution the utmost skill and attention of the architect, the engineer and the contractor. Some of these technical details of construction have been selected for description and illustration.

DANIEL HUDSON BURNHAM
Architect

THE FOUNDATIONS.

In the foundation of most large buildings the engineer and architect find very interesting problems for consideration. It requires the closest study and gravest consideration by scientific and eminently practical men upon the numerous important details that go to make up the proper foundations for a building of this magnitude in order to insure a safe and permanent structure. The latest system to be adopted in Chicago is the caisson foundation and the rule with skyscrapers of the day is to go down to bed rock.

The caissons upon which this building stand are eight feet in diameter and about one hundred feet in depth, resting upon bed rock, making a foundation that can not be disturbed without a great upheaval of the bed rock itself. The amount of steel that was necessary to complete the superstructure was about 10,000 tons. The first section of the building required about 5,500 tons and was set between February 26, 1903, and June 13, 1903, and the last section of 4,500 tons during the time between April 16, 1904, and June 18, 1904; this last was all put up in fifty working days by Charles Volkmann & Co., contractors and iron setters. They used four engines and derricks for this work. Such a feat of heavy construction work has hardly been equaled. The construction of this great building was in charge of the general contractors, John Griffiths & Son.

INTERIOR FINISH AND DETAILS

The great feature of the interior finish of this building is the marble work. It must impress the architect with the magnitude of the work as a whole when he considers that there were used in this work five thousand tons (making one hundred and fifty car loads) of this beautiful white stone, which was transported from the quarries of Vermont for this great structure. In the corridors of the office portion over three miles of marble wainscoting seven feet high was finished and placed by the Chester N. Marthens Marble Company of Chicago, which, with the variegated tile floors in the vestibule, and other marble work in the building, made their contract about $250,000. It is said that the cost of all the marble in the interior of this building was about $400,000, which was all furnished by the Vermont Marble Company.

The club room is on the top floor of the building and is a very complete and beautiful rest room for those whose connection with the bank or firms in the building make them eligible for membership to the Mid-day Club. The air of simple elegance that pervades these rooms has an attraction in it that is highly appreciated by the busy man who has a few moments to spare at lunch time. The decorations are light and graceful, enhanced by the large ceiling lights in beautiful designs in tones of amber and green opalescent glass, very rich in color but preserving all the light properties while flooding the rooms with radiant color. It is due to McCully & Miles Company, the ornamental glass designers, who placed this bit of high art work, that they have the credit for this added attractiveness to the room.

AUTOMATIC CARRIERS.

Automatic delivery and exchange of valuable papers from one department to the other in a bank of this magnitude is of great importance to the economical and systematic handling of business. In the system of delivery in the First National Bank every possible precaution was taken to make the system perfect. The work was done under

the supervision of a most reliable superintendent. This system is operated by compressed air, which forces the carriers through the tubes connecting the official's desk to the central station. Each carrier is marked for its proper destination, consequently there are no lapses of memory at the central station. The tubes are distributed and sent to their destination in about ten seconds from the time they leave the sender, thus making a sealed communication and special delivery from one officer of the bank to another. In the daily transactions of a banking business there are thousands of messages with important papers that must be given immediate attention and delivered in person at the expense of valuable time, or by messenger at the risk of costly mistakes, all of which is eliminated by this system, one man's signature being a check against the other's memory. The system was installed by the Lamson Consolidated Store Service Company.

Located upon the ground floor, with an entrance from Dearborn street, are the two great vaults containing over two thousand square feet. They are built of steel and iron four inches thick and then covered with masonry three feet in thickness. The massive doors, each weighing thirty-four tons, are protected by four movement time locks, with all electrical connections.

THE POWER PLANT—GENERATORS AND MOTORS.

The basement floor, containing about 40,000 square feet of space, was used to accommodate the mechanical plant—W. L. Jackson, engineer in charge—including all requisite machinery, boilers, motors, etc., for the production of steam and electricity for light, heat and power adequate for the needs of this great building.

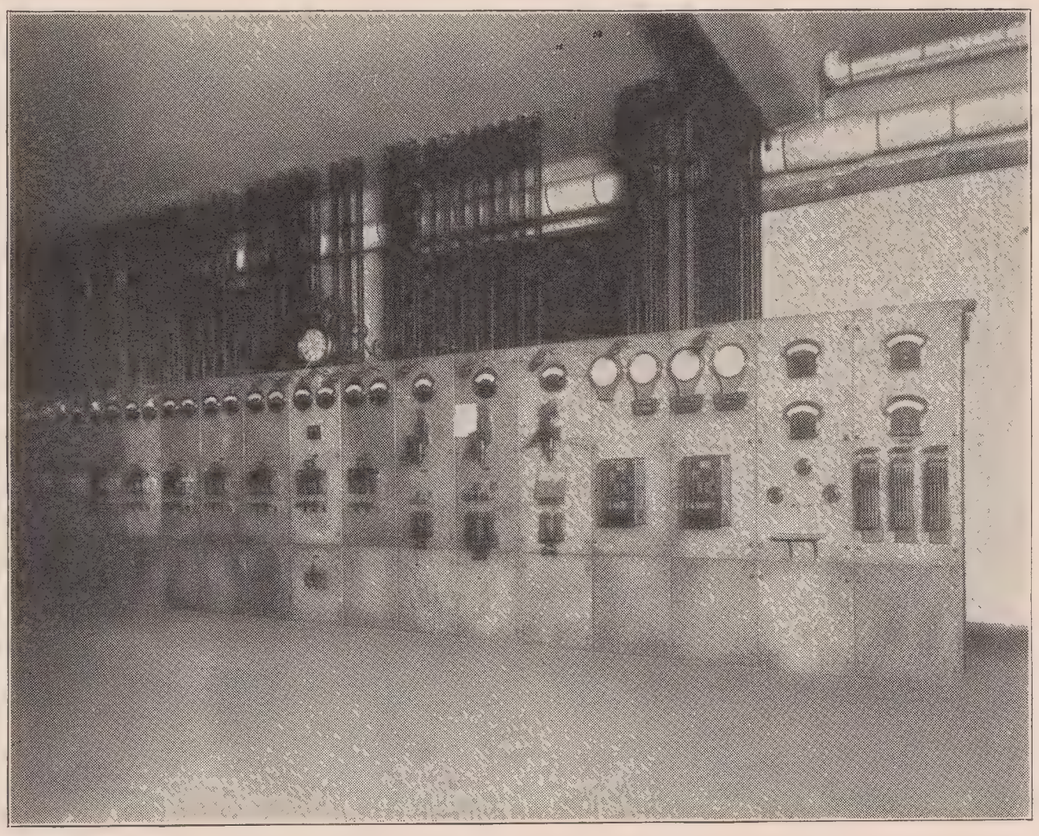
The amount of power and light which is required in the operation of this building can hardly be realized from a comparison with the requirements of an ordinary business building plant. The installation of this great plant is as perfect in its operation as the highest grade of mechanical skill in contrivances could make it. The electric current used for lighting and for power is developed by four direct-current generators, which, together with the motors used in the plant, were furnished by the Crocker-Wheeler Company, Old Colony building. The four generator units are shown in our illustration. The generators are of 150-kilowatt capacity each, generating current at 125 volts. They are direct-connected to Ball vertical cross-compound engines running at 225 revolutions a minute. The engines run non-condensing, the exhaust steam finding ready application for heating the building during the winter months. The Michigan system of forced lubrication is used, the oil being filtered in three Turner oil filters. A. S. Schulman, of Cincinnati, was the electrical contractor, and installed all the electrical machinery, wiring, etc.

THE BLOWERS.

Our illustration makes an interesting exhibit of a feature of the American Blower Company's plant. The equipment is installed in duplicate, giving assurance of the continuous service that is imperative in a building of seventeen stories where a lack of power means the lack of all the essentials of a modern office building. One of the units of this plant is a steam-driven fan 160 inches in diameter, consisting of a special narrow Housing 9-foot wheel driven by an 8x8-inch vertical—marine type—engine, capable of delivering 35,000 cubic feet of air per minute, 2 ounce pressure per square inch when running approximately at a speed of 450 revolutions per minute. The speed of this engine is controlled by a Tagliabue pressure regulator of the Roesch type, automatically by the steam pressure carried upon the water, thus controlling the air supply in accordance with the steam demands. The duplicate equipment consists of a 110-inch steel plate fan direct connected to a 110-volt direct current Crocker-Wheeler motor, having a Cutler hammer speed controller. The air supply delivered to the inlets of both fans is taken from above the boilers. The forced draft is delivered to the furnaces of the boilers by means of branch ducts having valves for controlling the supply which is taken from a common duct into which both fans deliver the air. Each fan is capable of delivering sufficient air for all boilers when operated independently. They can always be operated separately, one as auxiliary of the other. This plant is installed for the purpose of providing a forced draft for the Jones underfeed mechanical stoker.

HEATING AND VENTILATING PLANT.

In connection with the heating plant the hot blast over air coils is one of the systems in vogue throughout the two lower floors including the entrances. It is known



The Switch Board.

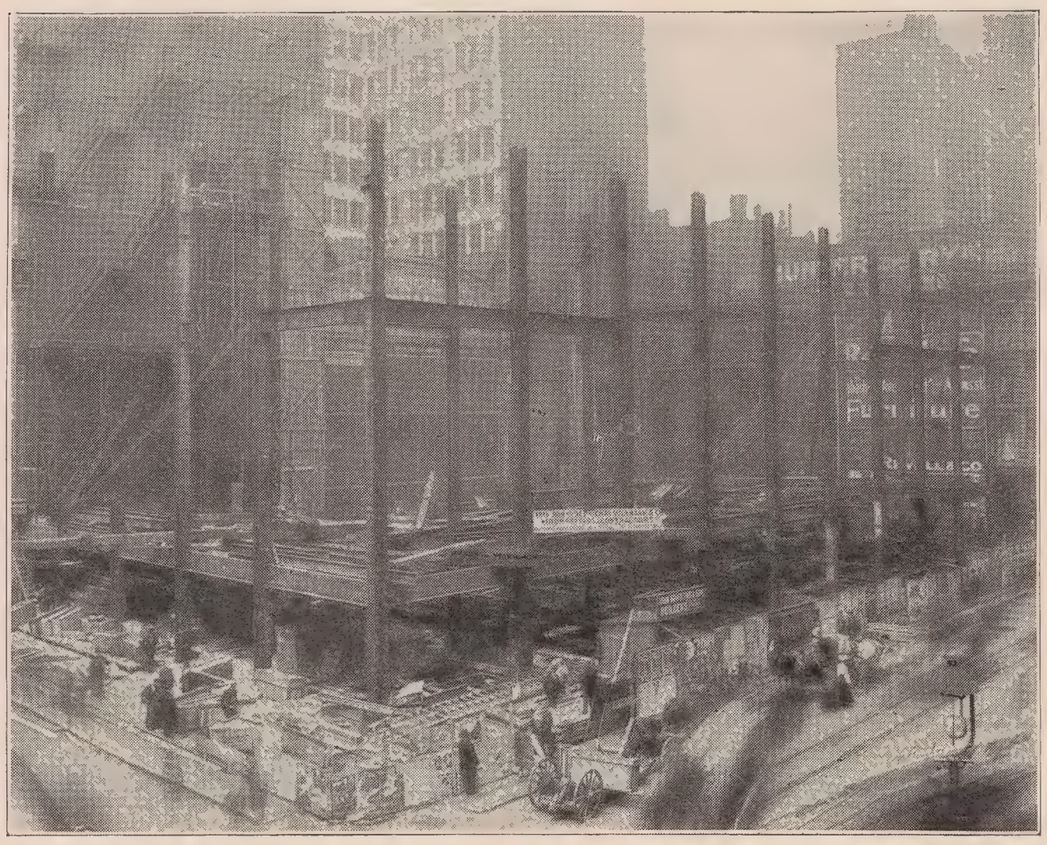
as the indirect radiation in distinction from the direct radiation. By this method fresh air is drawn from the outside by an electric fan and passes through a shower bath of water which cleanses it and increases the moisture. It then passes through the last series of high temperature coils and is forced out by the action of the fans throughout the lower floors of the building, all entrances and bank floors and is supplementary to the direct radiation which is installed for the whole building, and is rated at about 78,000 square feet of radiation. This great system required large numbers of high-class radiators and an enormous quantity of steam pipe, the length of this pipe being equivalent to forty-six miles of one inch pipe and would weigh two hundred and thirty-four tons.

All of the material for the direct radiation was furnished by the American Radiator Company, whose offices and salesrooms are at 382 Michigan avenue, City, occupying a large six-story building. Their works are situated at Detroit, Mich., Buffalo, N. Y., St. Louis, Mo., Springfield, Ohio, and Titusville, Pa. The indirect radiation plant coils and fans were furnished by the American Blower Company of Detroit. This company furnished

all the fans for the ventilation system in this building which is most complete as the air is changed through the building every few minutes, the safety vaults and toilet rooms being ventilated by a series of exhaust fans which operate to exhaust the vitiated air, and the pure air forces its way into the space thus made. This vitiated air is carried out through a flue upon the roof of the building.

SWITCHBOARD.

A switchboard of unusually attractive appearance has been installed, as shown in our illustration. Together



VIEW TAKEN MAY 7, 1904
STEEL WORK SET BY CHAS. VOLKMANN & CO.

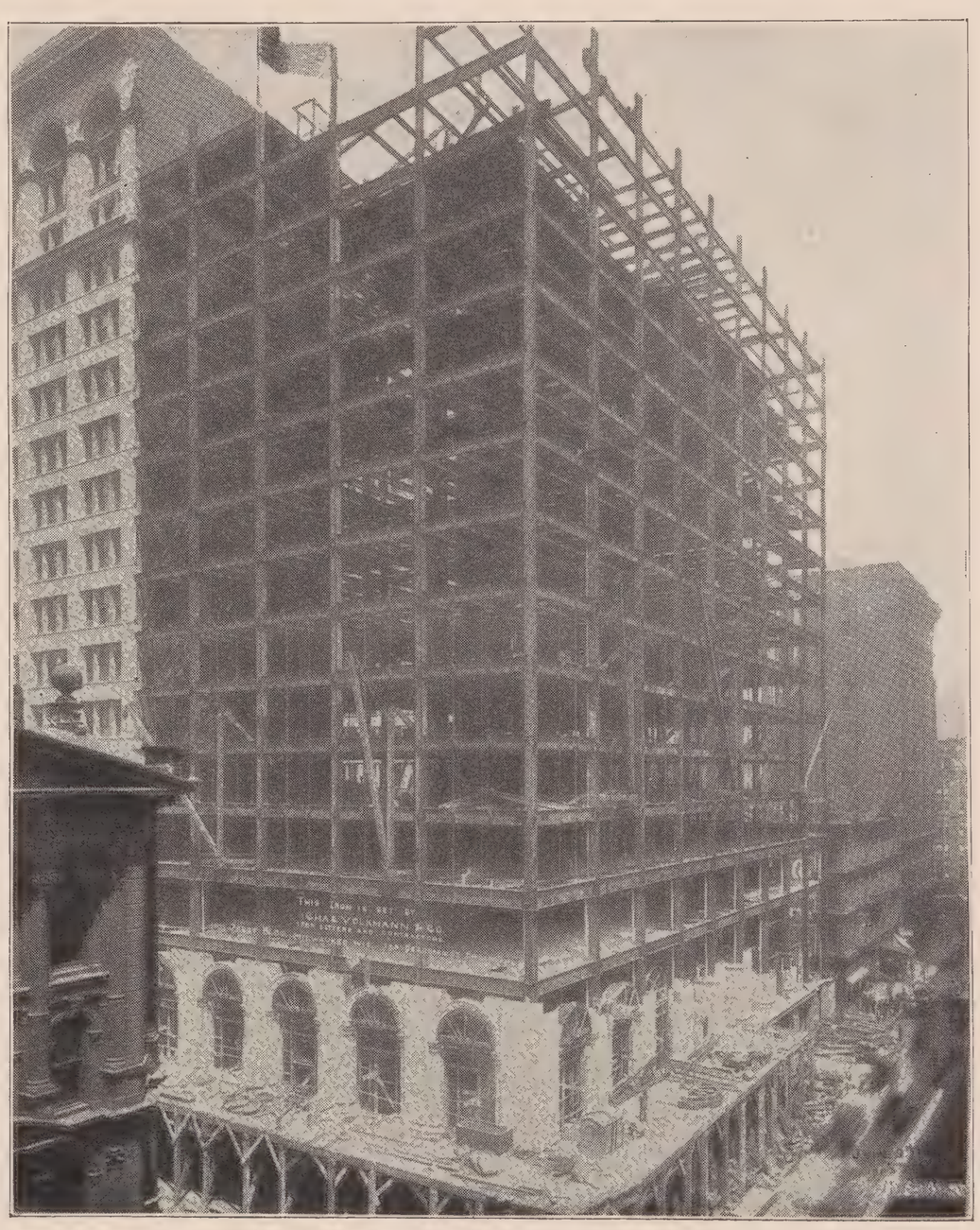
with the switches, it was furnished by the Crouse-Hinds Company. The board is of slate, handsomely polished and trimmed with copper molding. It contains twelve panels in all. The four at the farther end are the generator panels and are equipped with Weston ammeters, a Weston voltmeter being mounted on a bracket on the end panel. Next to the generator panel is a panel containing two Thomson recording wattmeters and one Bristol recording voltmeter. The remaining panels are for the various feeders, motor circuits, etc. Back of the board, as can be seen, are auxiliary panels for testing out circuits, for the fuses and for the meters. The circuits are all divided in shunt on the board, so that any of the circuits can be tested by test meters without interrupting the service. These tests are made to ascertain the cost of various operations, such as the pumping of water, the running of the ice machines, etc., and are useful to the operating engineer to enable him to run the plant in the most economical manner.

ELEVATORS.

Twenty-two elevators will be required to supply the needs of the tenants of the building. Twenty-one of these are hydraulic and one electric. The hydraulic elevators, supplied by the Otis Elevator Company, are on the high-pressure system, operating under a pressure of nearly 900 pounds to the square inch.

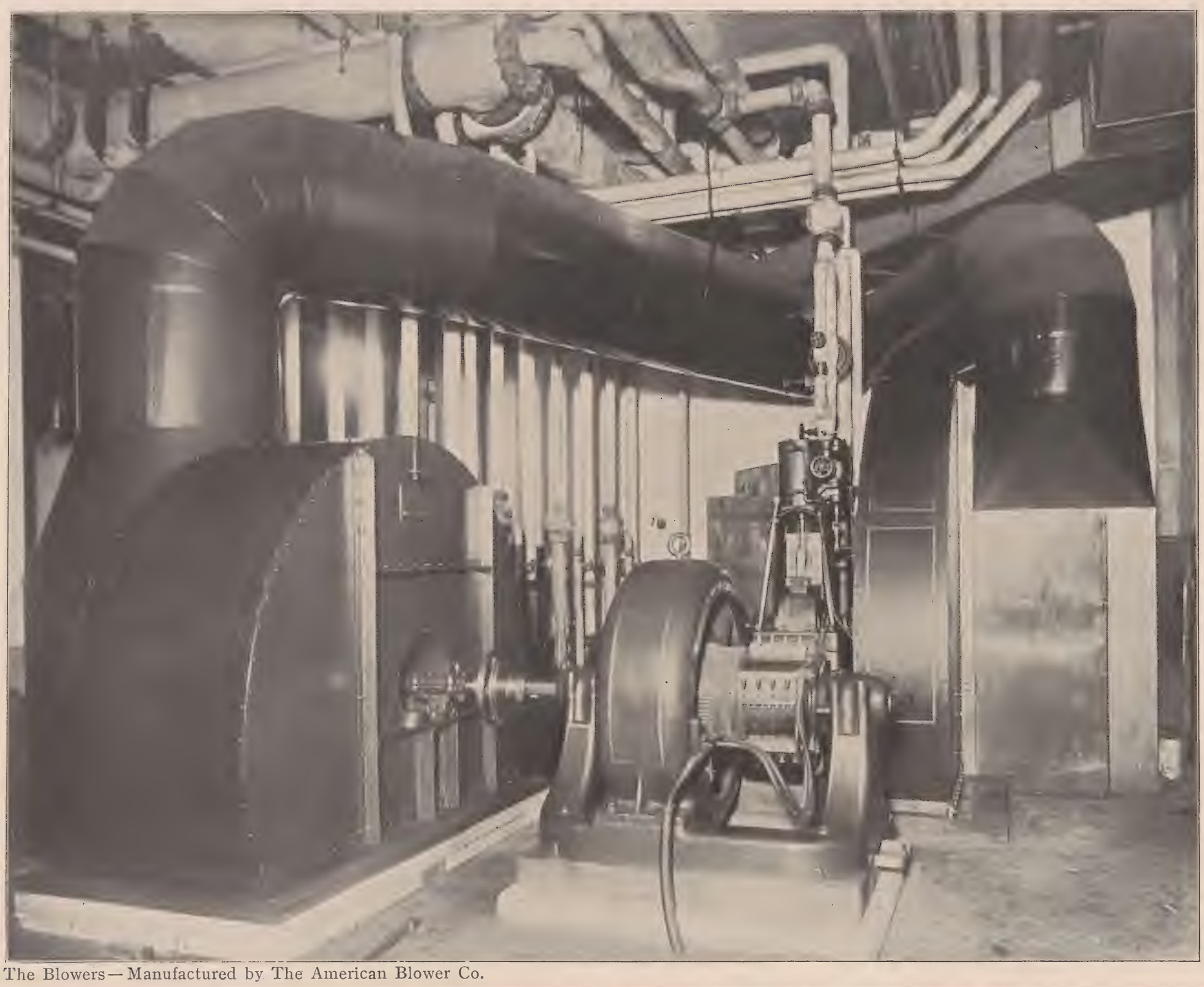
UNDER-FEED MECHANICAL STOKERS.

In keeping with other up-to-date labor and money saving appliances installed in the power plant of this big building the boilers are mechanically fired, each of the five units (total 1,850 h. p.) being equipped with three Jones under-feed mechanical stokers, a total of fifteen as shown in accompanying boiler room view. Economy in boiler plant operation, embracing saving in cost and utilization of fuel is the principal object attained, although the clear stack of this centrally located building serves as a daily reminder to thousands of passers by on the streets, that the perfect combustion being secured renders the making of smoke impossible. Without attempting an extended description of the apparatus we can convey a readily comprehendable idea of its operation in a few sentences. Outside the boiler is the steam cylinder, ram case and hopper; inside the furnace simply the retort or magazine in which the coal is held, and having hollow iron tuyeres around its upper edge through which air is forced above the green fuel and below the heavy body of incandescent fuel always carried in the furnace. Dead plates extend from either edge of the retort to the side furnace walls and between the stokers, there being three under each boiler, making an air tight chamber of what is usually denominated the ash pit in ordinary boiler practice. When descending through the hopper the coal falls to a position immediately in front of the ram, which in its forward stroke carries a fixed quantity into the furnace. This introduction of fuel is always from beneath, whereby this system of firing derives its name of "under-feed" in contra-distinction to the methods usually employed. Repetition of this process at frequent intervals elevates the green coal to a position in which it passes through a process of coking because of the heat generated in the incandescent mass of fuel lying at the top, as described above. The point at which the gases are being released and proper admixture of air taking place through the tuyeres is the stage in which perfect combustion is



VIEW TAKEN JUNE 9, 1904
STEEL WORK A MONTH LATER

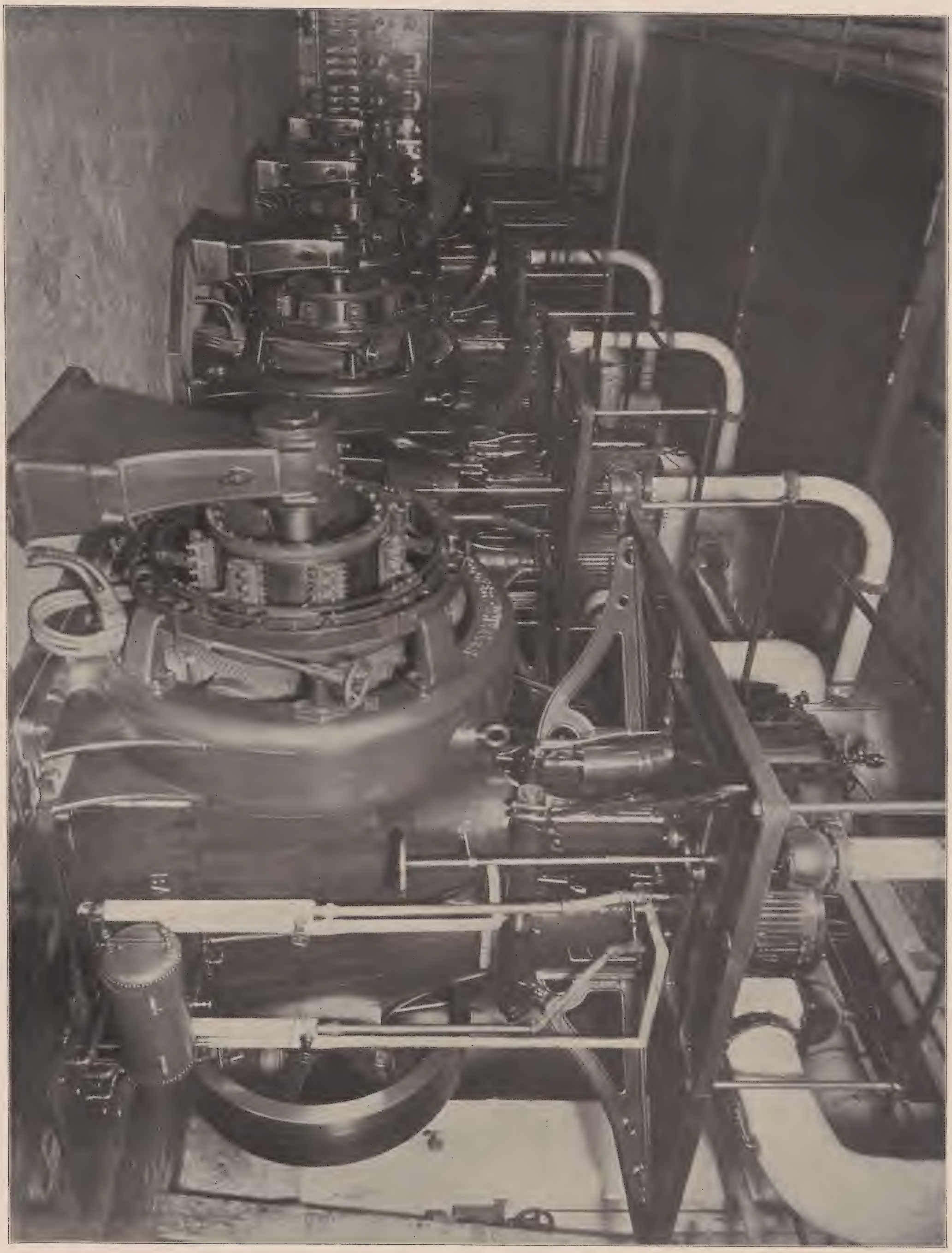
secured and the making of smoke effectually prevented. In this method of firing any grade of coal from the cheapest slack up through the various grades to the most expensive lump, can be used without any change whatever in the operating mechanism of the stoker.



The Blowers—Manufactured by The American Blower Co.

The Jones Under-Feed Mechanical Stokers

THE POWER PLANT, FIRST NATIONAL BANK BUILDING



Generators and Motors
Manufactured by Crocker-Wheeler Company

THE POWER PLANT, FIRST NATIONAL BANK BUILDING

One of the most interesting features and at the same time one of the distinctive advantages of this system of stoking is the absolute control maintained over furnace operating conditions. By means of an automatic attachment intervals of forward movement of the ram are controlled, thereby fixing the quantity of fuel introduced into the furnace during a given period. To supply air for combustion in quantity proportionate to amount of fuel being consumed, and to meet changing conditions in loads, the output of the blower is automatically increased or diminished as required. This is brought about by causing the steam pressure to regulate the speed of the engine driving the blower through a Tagliabue regulating valve. Proportioning the fuel supply and the air supply in this manner serves to promote a practically perfect combustion, a stage in which the maximum of economy as well as efficiency is realized, at the same time accounting for the smokeless chimney. The apparatus was installed by the Under-Feed Stoker Company of America, whose general offices occupy an extensive suite in the Marquette building, Chicago, and in addition to which a large number of branch offices and sales agencies are maintained in all the principal industrial centers of this country and Canada.

CENTRAL STATION

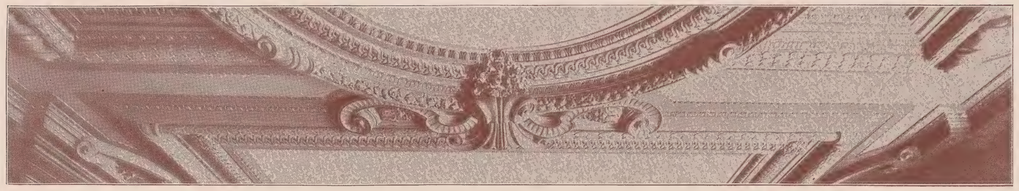
DESK SERVICE

THE PNEUMATIC TUBE SERVICE IN THE FIRST NATIONAL BANK

Installed by The Lamson Consolidated Store Service Co.

ART

SCIENCE

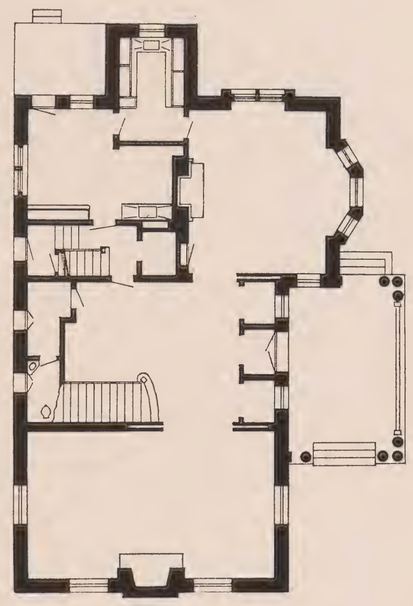


Modeling by McNulty Bros. DETAIL OF CEILING DECORATION IN DIRECTORS' ROOM

COMMERCE

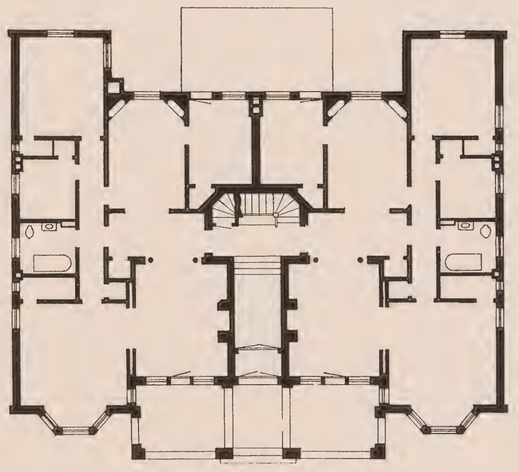
LABOR

MURAL PAINTINGS IN THE PRESIDENT'S ROOM, FIRST NATIONAL BANK.



RESIDENCE FOR W W. SYLVESTER, KANSAS CITY, MO.

ROOT & SIEMENS, ARCHITECTS.

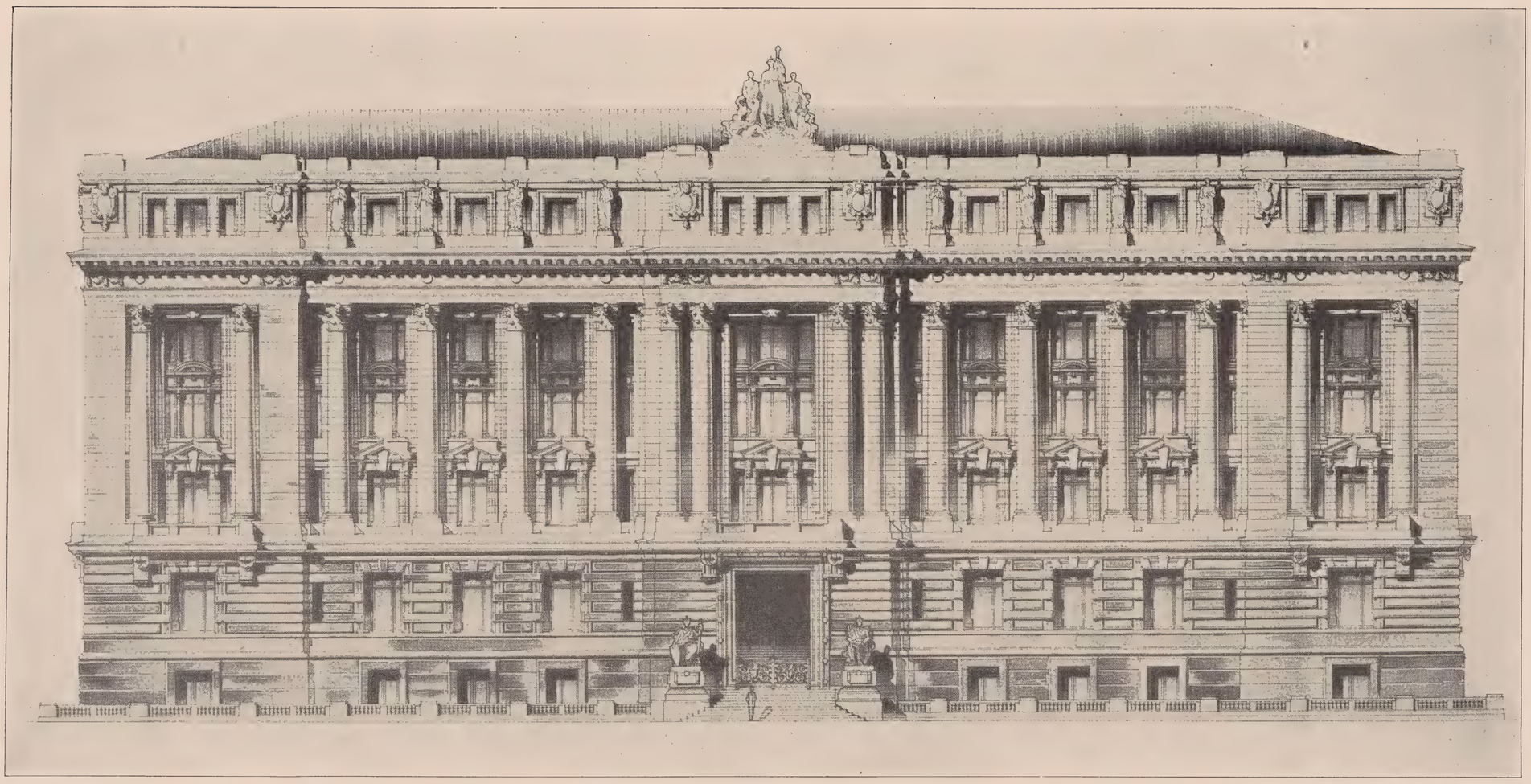


THE ILLINOIS APARTMENT BUILDING, KANSAS CITY, MO.

ROOT & SIEMENS, ARCHITECTS.

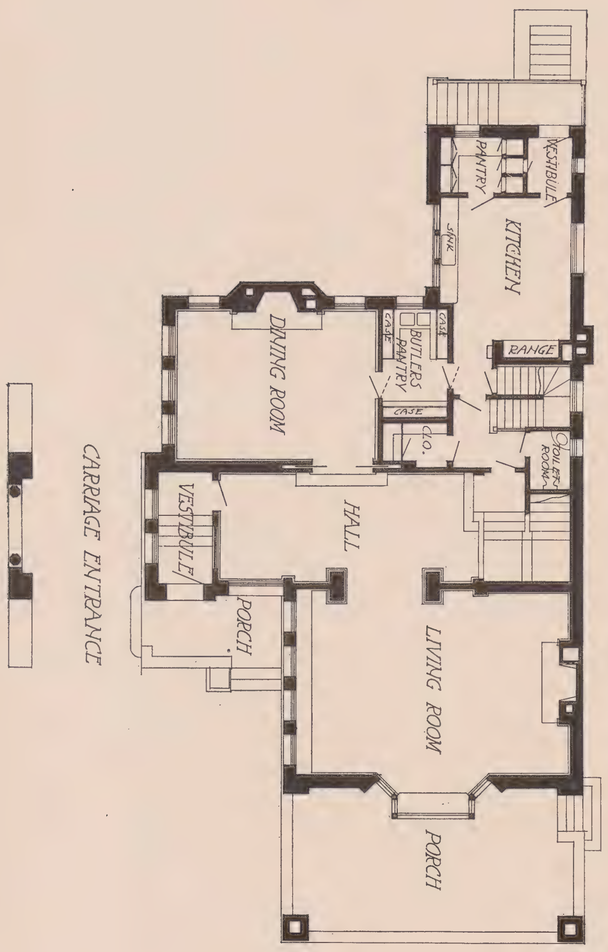
GENERAL VIEW, BALL-ROOM, RESIDENCE, ST. LOUIS, MO.

Mauran, Russell & Garden.



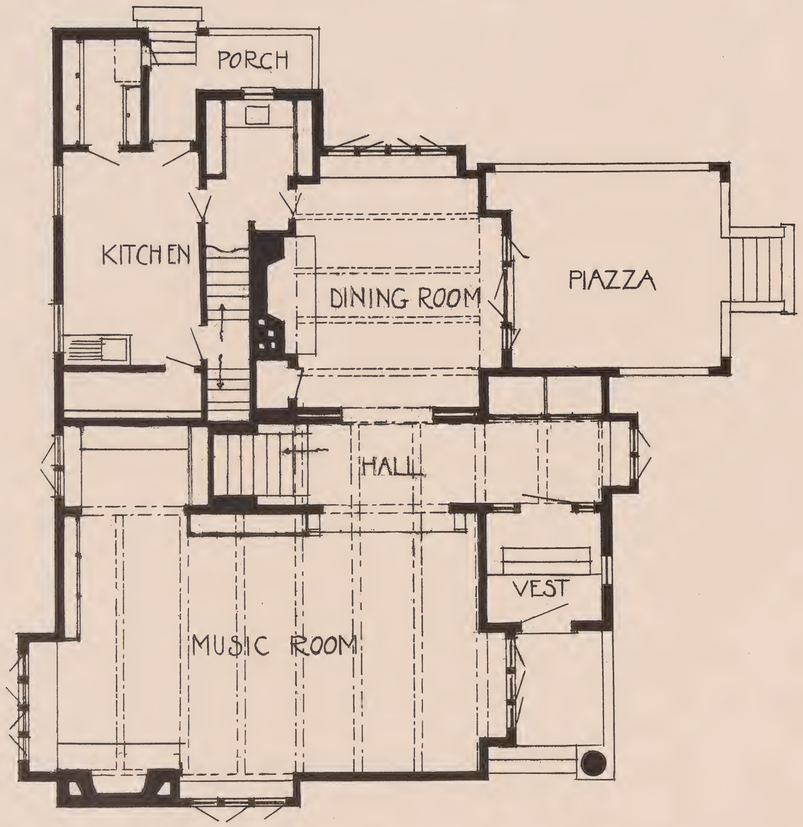
MUNICIPAL BUILDING FOR THE DISTRICT OF COLUMBIA

Cope & Stewardson, Architects, Philadelphia.



RESIDENCE FOR L. WOLFF, JR.. CHICAGO.
RICHARD E. SCHMIDT, ARCHITECT

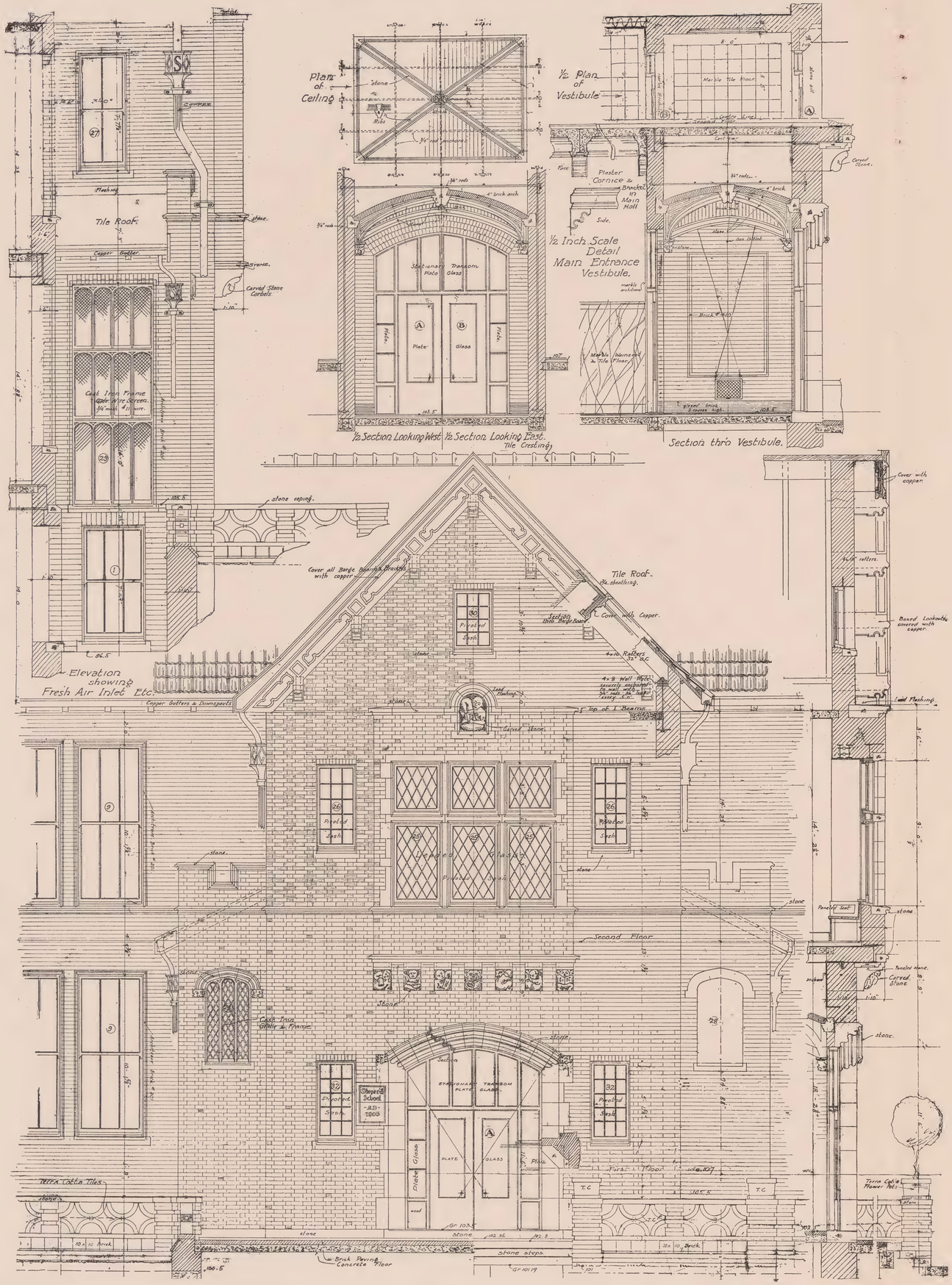
KENWOOD CHURCH, KENWOOD, CHICAGO.
JOHN S. WOOLLACOTT, ARCHITECT.



VOL. XLVI. THE INLAND ARCHITECT AND NEWS RECORD No. 4.

RESIDENCE OF F. N. CORBIN, KENILWORTH, ILL.

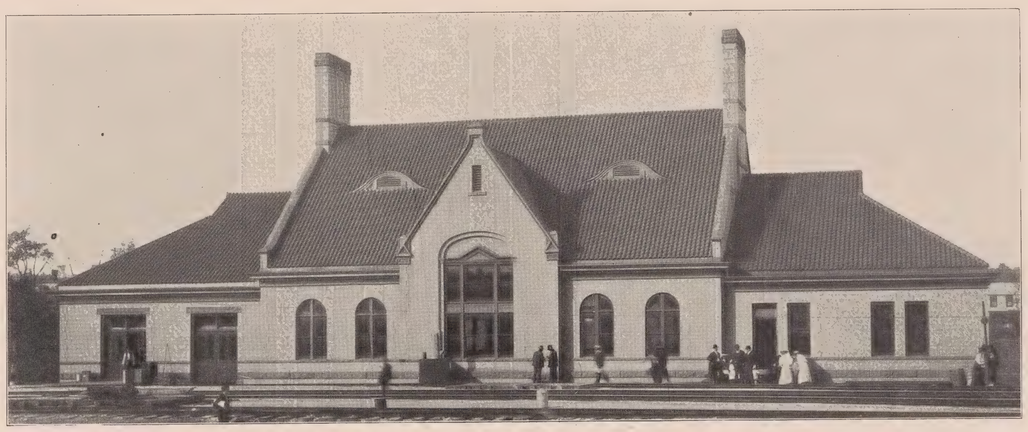
GEORGE W. MAHER, ARCHITECT, CHICAGO.



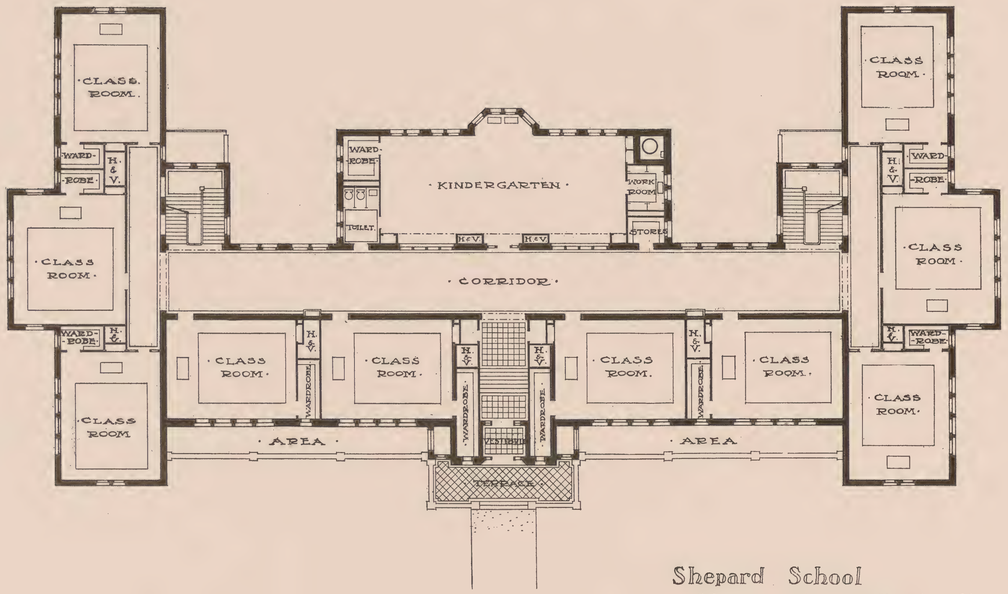
DETAILS, SHEPARD SCHOOL BUILDING, ST. LOUIS, MO.

WILLIAM B. ITTNER, ARCHITECT.

STATION FOR LACKAWANNA RAILROAD, NEW YORK CITY



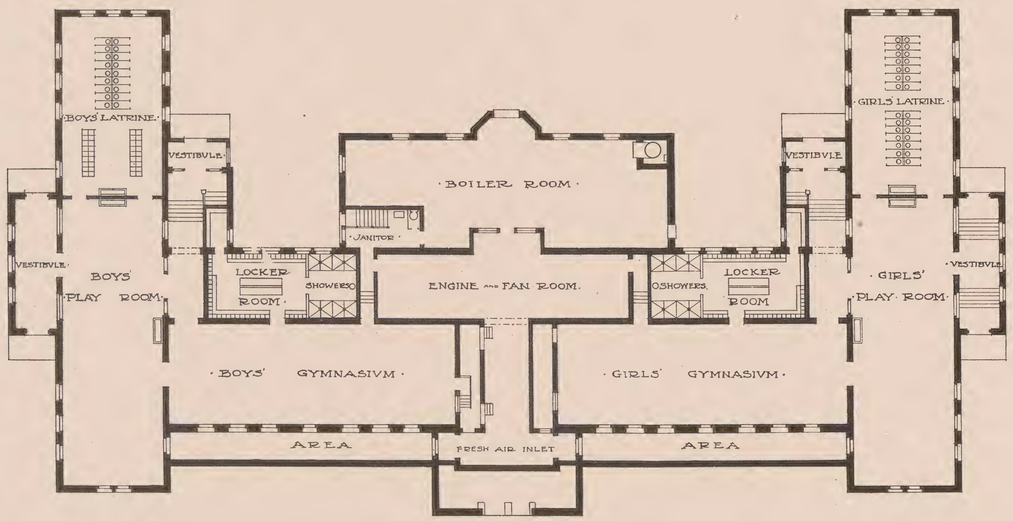
STATION FOR BALTIMORE & OHIO RAILROAD, YOUNGSTOWN, OHIO.



Shepard School
Wisconsin Ave near Cherokee St.
St Louis Mo.

WILLIAM B. ITTNER ARCHITECT.

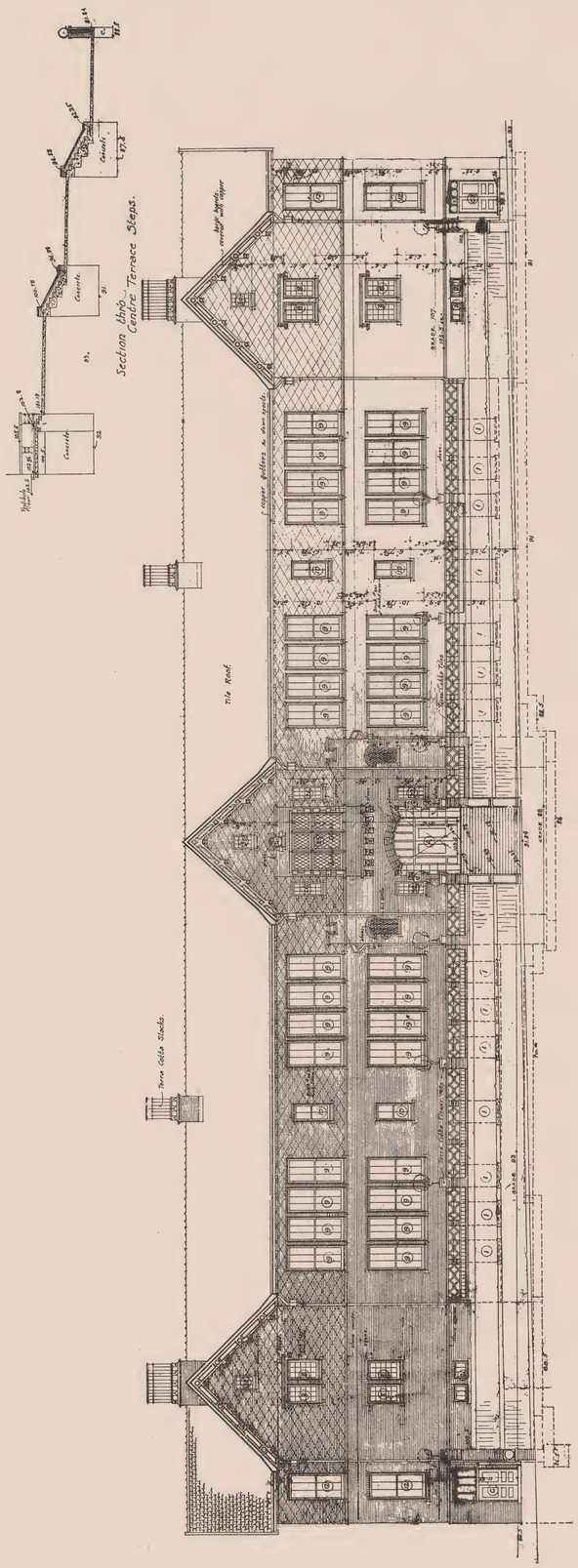
FIRST FLOOR.

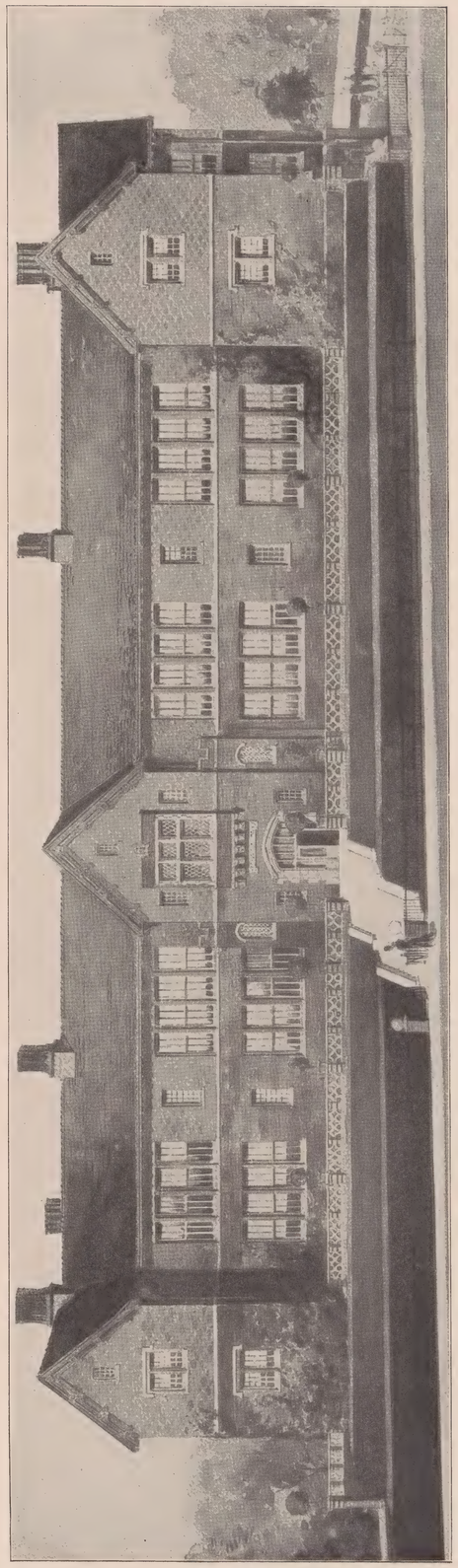


Shepard School.
Wisconsin Ave near Cherokee St.
St Louis Mo.

WILLIAM B. ITTNER ARCHITECT

BASEMENT FLOOR.





THE SHEPARD SCHOOL BUILDING, ST. LOUIS, MO.
WILLIAM B. ITTNER, ARCHITECT.

FIRST NATIONAL BANK BUILDING, CHICAGO

D. H. BURNHAM & CO., ARCHITECTS

MAIN STAIRWAY TO BANK FLOOR, FIRST NATIONAL BANK BUILDING, CHICAGO

D. H. BURNHAM & CO., ARCHITECTS.

VIEW INTO BANK ROOM FROM LANDING OF MAIN STAIRWAY, FIRST NATIONAL BANK BUILDING, CHICAGO

D. H. Burnham & Co., Architects.

VIEW OF MAIN BANK FLOOR.
FIRST NATIONAL BANK, CHICAGO.
D. H. BURNHAM & CO., ARCHITECTS.

VIEW IN PRESIDENT'S ROOM.

FIRST NATIONAL BANK, CHICAGO.

D. H. BURNHAM & CO., ARCHITECTS.

VIEW TOWARD ENTRANCE.

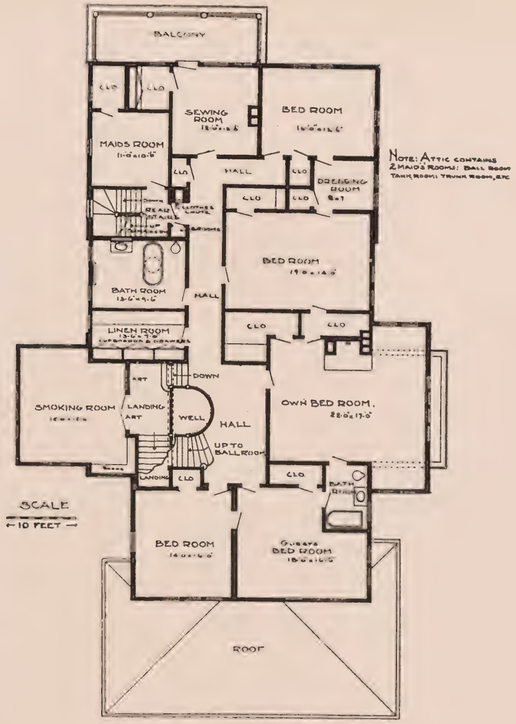
VIEW IN BALL-ROOM, RESIDENCE, ST. LOUIS, MO.

MAURAN, RUSSELL & GARDEN, ARCHITECTS.

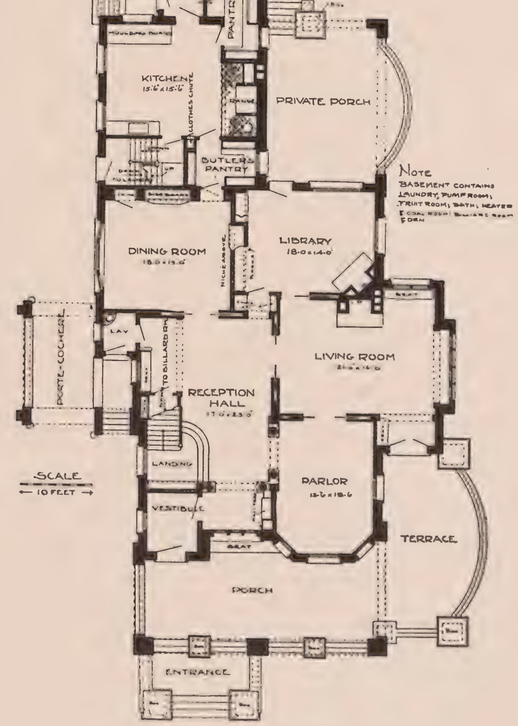
MANTEL IN BALL-ROOM, RESIDENCE, ST. LOUIS, MO.

MAURAN, RUSSELL & GARDEN, ARCHITECTS.

RESIDENCE OF MRS. L. A. TODD, OAK PARK, ILL.
E. E. ROBERTS, ARCHITECT.



SECOND FLOOR



FIRST FLOOR

MUNICIPAL IMPROVEMENTS

BY ALBERT KELSEY, CHAIRMAN OF THE COMMITTEE OF EXPERTS OF THE ART FEDERATION OF PHILADELPHIA

PART IV—WATER FRONTS

WE have seen that to start right it is necessary to have a good plan—that if a good plan is adopted and adhered to, good results must follow, no matter what is erected upon it. Manufacturing plants for a time may pollute its streams, scores of industrial establishments may foul the air, and private property owners may rain down torrents of ugliness upon their own holdings, and yet there will remain inherent in the plan a beauty that the blackest smoke of industrialism can not obscure.

What are the controlling elements in such a plan? They are geographical and topographical conditions. By geographical conditions is meant the relation of the site to contiguous areas, including both land and water, while topographical conditions refer to the conformation of the site itself. When a site conforms to an interesting shore line, is traversed by a river, or distributed, like Venice or Boston, between and in among water-ways, these liquid areas control the plan—or should control the plan if it is intelligently studied—and in fact does in a measure control even such a poor plan as Manhattan's, where the avenues are all forced to run north and south on account of the narrowness of the island, but much better illustrated by Venice, which without a formal and organic plan, is made uniquely beautiful by its network of sunny lagoons and shady canals. The opposite is unfortunately true of Boston's old cow-path plan, since there all thoughts of water frontages and refreshing street vistas terminating across glistening sheets of water have been until recently ignored.

An observant traveler approaching an American city from its water front can not fail to be struck by the contrast between the natural beauty of our harbors and rivers and the disorder and ugliness that have come upon nearly every place that man has chosen for a center of life and activity. Cities have been called the earth's festers, and one who arrives at New York, either by way of the open harbor or from the Hudson, after passing through scenes of natural magnificence, must indeed feel that this assertion is justified. It is a strange truth, but most American cities, bad as are their approaches by rail or by road, are still at their worst along their water fronts. Even in New York, in spite of its enormous commerce and great wealth, in spite of the fact that it is the official entrance port of the continent and so recognized by the colossal figure of Liberty Enlightening the World, presented by France at a time when light was even more sadly needed in the improvement of that harbor than it is today, and in spite of the fact that it is the one place where diplomats and distinguished visitors make their entrance, yet this metropolis has no official or even worthy landing place, but treats its visitors with indignities that increase from the moment he sees the garbage float down the river until he is landed in a street roughly paved and often full of puddles and refuse, where his life is more or less endangered by rough wagons and other vehicles bent upon commercial pursuits.

The disgraceful confusion attending the mob-like reception of the Czar's envoys in August, was but the natural outcome of existing conditions. To be sure a granite sea-wall at last forms a bulk-head along part of both arms of the harbor, and West street is theoretically 250 feet wide but actually less, owing to the erection of large head-houses for most of the steamship companies' piers and for all ferry houses, out on the roadway. Also, several promising recreation grounds have been opened on the East Side, and it can not be denied that the parking of Riverside drive on the North river is truly encouraging, but these scattered improvements—which do not impress one from the harbor, are in crude contrast with the inviting entrance Palermo offers with its massive, unified breakwater and clean docks, with its permanent and even monumental reception place facing a wide and smooth sea-walled road, which serves as a reviewing stand and orchestra shelter on ordinary occasions. Or to come to a more democratic example and a case more parallel to that of New York, we might be proud to take a lesson from the city of Bordeaux, where the place of entry is marked by two large rostral columns and an open space set apart for occasions of ceremony. Such a place would serve as an official entrance, and also as a place where individuals could land without the inconvenience that attends the hundreds who now come daily to New York on private yachts.

New York harbor is not our only slipshod harbor, and in fact it is a great improvement on many, where filthy, inflammable and malodorous private docks on flimsy, creaking piles only offer safe shelter and real hospitality to wharf rats and river thieves. This condition is the more shocking to every sense of decency since it is so wantonly needless. Portland, Maine, San Francisco and Boston have glorious scenic advantages and are natural harbors, requiring but a little uniformity to make them more efficient and to preserve their beauty, while many of the great ports abroad have been artificially constructed at an enormous cost, and every basin and dry-dock had to be constructed to especially overcome forces of nature; and yet, working against such odds, every maritime country of Europe has more orderly, more hygienic and more permanent harbor facilities than any port in the United States.

A water front, even though now given up exclusively to commerce, can be redeemed. In fact, the exigencies of increasing traffic by rail and water may be much better met under a comprehensively readjusted scheme. Such a system is being completed at Salina Cruze, in Mexico, as a terminal for the Tehauntepec railroad, which, if the writer is correctly informed, will soon rival in acreage, in equipment and in permanence, the great dock-yards of Hamburg. This system is all of a piece because it was done all according to a far-seeing plan.

A commercial water front must provide ample railway facilities, but not as many wide-awake Americans seem to think, to the exclusion of everything else. At Algiers, in North Africa, an extensive track yard, with many low freight houses, occupies the immediate water front, while the natural slope of the land has made it possible to

construct a great elevated stone arched viaduct on the hillside above. It is the famous Boulevard de la Republique, and from every point along its entire length one gets a superb view, to which interest is largely added by the busy shipping below. At Antwerp, where the shore is flat, a popular promenade is supported on slender steel columns for several hundred yards directly over the busiest docks, thus actually securing a twofold utility from the same area, and in both these cases aesthetic considerations appear to dominate. The French in Algiers had the cleverness to leave a beautiful white mosque at the end of the great modern thoroughfare, whose name so incisively recalls the Mother Country, and the Belgians have likewise kept local conditions alive by restoring an old Flemish building to form a focal point at the end of their strikingly modern promenade.

Now, turning exclusively to river front treatment, we have on the one hand the squalid manufacturing town with its ungainly factories built along banks between the river and the race, thus obscuring an open view, and on the other we have the walled rivers of Europe, of which Paris and Buda Pest offer the best examples. The quays and shaded river drives of Paris are famous. Here the requirements of commerce and recreation are carried on side by side, and yet entirely independent of one another, but to be sure the Seine is not a river from which much power is drawn. Throughout Germany, however, there are many such streams where factories and communal parks alternate along race-ways, thus giving a partial air of tranquility and repose to these busy spots. In contrast to this inspiring picture, consider an example of industrial depravity along the Schuylkill. Dr. Edward Martin, director of public health, said two years ago: "Philadelphia wants drinking water, and not solid food." And yet, notwithstanding annual trips of inspection, followed by vigorous reports, and voluminous newspaper reports which are given wide publicity, the banks of the river from which Philadelphia draws two-thirds of its water supply today are lined with cemeteries, industrial plants, stables, privies, abattoirs, pig pens and hen coops for fifty miles above the intake, and any day, at more than one point, the river may be seen running thick with grease and opalescent oily surfaces which flash gaudy metallic colors from splotches of iron scales set adrift by the furnaces of Manayunk, Phoenixville and Reading. A facetious reporter adding that "a particularly rich deposit is injected from the Norristown Insane Asylum."

It is to be hoped that the horrors of the Schuylkill represent an extreme case, but every American knows that more or less polluted streams with banks strewn with refuse, and cluttered with filthy buildings is still the rule. Some day we shall improve all this, and at one bound we may concentrate much more than has been done abroad in like areas. In order to draw a more hopeful picture, let us consider the possibilities of a navigable river, such as the Allegheny at Pittsburg, a river subject to sudden rises and falls, which widens and narrows with every rain.

Instead of unhealthy mud flats left exposed during droughts, imagine the river compressed between clean stone docks, thus making the entire water surface navigable at all times. On the other side, a steep riprapped embankment would rise to protect railways and canals from inundation, allowing sudden floods to sweep harmlessly over the docks, and on top of these breastworks there would be a long, shady promenade. Then across the depressed tracks and canals would be a tree-lined road, and back and facing this would be great warehouses, approached by rail through tunnels built somewhat like Chicago's under ground freight road in the wholesale district. By such an arrangement, what is now waste land in many cities would provide on both shores, (1) warehouses on clean tree-lined streets, free from tracks; (2) direct railway lines and canals, protected from inundation and without grade crossings; (3) a narrow dike park; (4) docks such as those along the Seine, and (5) a river that would scour itself and be navigable at all times.

There is yet much more. There would be an utter detachment between these parallel avenues, freedom from congestion, freedom from loss by flood, freedom in circulation, and lastly a freedom in private and public, civic and social organization now unknown. In short, America may yet have the honor of contributing to city making an efficient system of orderliness and compactness similar in its underlying principles to the vertical filing system for business papers which has been the means of simplifying and developing modern business. Indeed, so much may be gained by bringing the units described above into closer touch with one another, that there is also room and opportunity to give back to the river a beauty equal to that which the present occupancy has taken from it. Man's possession does not necessarily mean the disordered jumble and half-mastery of his opportunities as exemplified at Albany, Cincinnati, Pittsburg, Baltimore, Washington, Norfolk, Kansas City and other cities of this type, but like the ancient treatment of the shores of the Tiber, they may be given an expression of mastery, and in addition, a many-sided usefulness suited to everyday surroundings.

Beautiful as are the banks of the Seine, they do not compare in monumental splendor with the marble and sculptured river walls that once girdled the island forming part of ancient Rome. A French student recently made a set of drawings restoring this design from such fragments as remain. It shows the entire island treated as a great ship, with temples, squares, streets and monuments arranged on a nearly symmetrical plan, while a colossal white marble prow and stern completes the composition.

Such splendor is not for a commercial age, yet at Annapolis, Md., our government is building a naval academy on truly splendid lines. The entire site is being transformed and soon from its terraces a shore line will be seen of which any modern port might well be proud.

Even this hurried article would be incomplete without considering the subject of reclaimed land, artificial lakes and the straightening of water-ways. Utica, N. Y., is about to abandon part of the old barge canal for a new length, to be built parallel with the recently straightened river, thus leaving a wide, open strip traversing the most congested part of the city, while the removal of the river channel has brought a large tract of formerly detached property into the city. But unfortunately, no many-sided plan has been adopted for the permanent treatment of these now available areas, and unless something is done soon a rare opportunity will be lost forever.

It will be remembered, as described in a previous chapter, Paris straightened a water-way by means of a

navigable tunnel, and in doing so also created a fine parkway and a salubrious residential quarter above. Such a bold example of municipal reconstruction makes our self-evident problems appear simple indeed, and yet the simplest of our undertakings are usually studied and carried out only from a single point of view. Such methods bring blundering waste, as exemplified by the new dam now building at Columbus, Ohio, for the storage of its water supply, which will back up the river for two miles, and yet, entirely independent of this undertaking, $17,000 is being spent to build a neighboring road which has not been planned to take advantage of the fine views and other opportunities this future lake will surely afford.

Returning to the subject of harbors, our deep sea rivers offer but few of the engineering difficulties encountered in constructing the unprotected sea ports of Europe, but on the other hand frequent changes of administration place many obstacles in the way which do not have to be overcome abroad, where under a paternal government appropriations are forthcoming for such works, and such works proceed regardless of minor politics. Few, however, know of an undertaking of this kind being carried out by a philanthropic individual, yet one of the greatest ports in the world was built in this way, and the resulting benefits, as they increase and multiply, not only benefit the inhabitants of Genoa, but also the inhabitants of all northern Italy, thus nobly glorifying the name of the Duke di Galliera, through whose intelligence and generosity it was made possible. In this is a hint for our own public-spirited citizens. One in Chicago, for instance, might add to his promised art museum a long, narrow island park along the shores of Lake Michigan, to redeem what the Illinois Central railroad has marred, terminating it in a modern port and dock-yard at the river's mouth.

In so brief and imperfect an article it is impossible to cover such a broad subject in all its phases, but it may not be amiss, in closing, to remind those who are seeking new outlets for their generosity, that no better use can be made of money than to supply a city with a far-reaching plan. And, like the Italian duke, if our merchant princes can still afford to carry out such a plan, or even a portion of it, they will add for generations to come to the material and moral prestige of the commuity so benefited. This is not a problem for city engineers and philanthropists only, it is one the average citizen—rich or poor—can no longer afford to ignore. He must ask himself, "Shall our water fronts be up-to-date, salubrious and starred with frequent breathing spots, or shall they remain foul power plants, sluggish traffic routes, or mere sluice-ways for drifting sewage?"

(To be continued.)

THE PLANNING OF HOSPITALS

BY T. M. CLARK, ARCHITECT

PART II

IN regard to the best arrangements of hospital wards, there is still great diversity of opinion among medical men. That they should be so completely independent that air from one ward can not enter another is agreed, but this is by no means the only question involved. Another, and practically the most important one, is that relating to the number of beds which a ward should contain. The present custom is to make each ward to a certain extent an administrative unit, under the charge of two nurses, one for day and the other for night work. As there is obvious economy in giving each nurse as many patients to look after as she can care for efficiently, the proper maximum number of beds to a ward is determined by the average capacity of a nurse; and experience has shown that thirty should be regarded as the utmost limit, for ordinary hospitals, and twenty for contagious wards. Of late years the tendency has been to reduce these figures materially, and few modern hospitals now allow more than twenty-four beds to a ward; while in many, the limit is twenty; and some of the most recent foreign hospitals have a maximum of sixteen, or even twelve.

As a hospital bed is of a fixed size, varying only within narrow limits, the dimensions of a ward depend primarily upon the number of beds to be accommodated in it. Apart from certain ecentricities of shape, such as circles or octagons, which have at times been adopted in pursuance of various theories of ventilation, or of supervision, the standard plan of a ward for a general hospital is a rectangular parallelogram, of length determined by the number of beds, and their spacing. Except in city hospitals, and others where planning is hampered by lack of room, or other circumstances, the beds are arranged in two rows, with their heads against the longer sides of the parallelogram; and, in the ordinary ward, each of these longer sides is provided with windows. It was once usual to arrange the beds in pairs, with a window between each pair; but the modern practice is to space the beds at equal distances along each side of the ward, and provide a window between every two beds. In order to give room for the usual hospital table between the beds, and for the movement of nurses and attendants, a space of at least five feet in width should be allowed; and, if the beds are three feet wide, this will give a spacing from center to center of the beds of eight feet. This is regarded as the minimum permissible spacing, many hospitals requiring nine or ten feet. The beds at the ends of each row, instead of being set in the corner of the room, where the circulation of air would be less perfect, are now always placed two and one-half or three feet from the end wall, so as to be accessible from both sides; and, in modern hospitals, a window is usually put in this part of the wall, close to the corner, so as to prevent any stagnation of air there.

The importance of arranging windows in the corners of hospital wards is due to the fact, which the designer of hospitals should keep in mind, that moving air, whether foul or fresh, clings with great tenacity to surfaces, either of walls, ceilings or floors, with which it is brought in contact, and creeps along such surfaces, as a rule, with much greater rapidity than it is diffused through the main body of air in the room. Any one can test this pe-

culiarity of the movement of air, which is of great practical importance, by turning on the gas for a moment in a room, without lighting it, and tracing by the nose the rapidity and intensity of its conduction along the wall-surfaces. Most sick people, perhaps from the effort of nature to throw off the disease through the skin and lungs, give off very abundant emanations, which, in some diseases, are so characteristic that an experienced physician can often tell, blindfold, what is the matter with his patient, by the smell of the air surrounding him. These emanations of sickness, while they may not be poisonous, are, at least, not conducive to the health of persons breathing them, and they are often accompanied with particles from the skin, or germs from diseased surfaces, which are positively infectious; so that it is very necessary to sweep away rapidly and continuously all the air which has surrounded a sick person, before it can reach his neighbors by diffusion, or creep to them along walls, floors or ceilings. For this purpose it is not enough to exhaust the foul air from the room by vacuum ventilation; in addition to this all wall, floor and ceiling surfaces should be blown upon by a current of fresh air, to sweep away the stratum of foul air, and the particles of organic dust, which will continue to adhere to them even while the main body of the air is changed. Fortunately, the air which enters a room through any opening, in consequence of the same property of clinging to the surfaces with which it comes in contact, spreads laterally to a certain extent as it enters; and the wall spaces between the windows, if not too wide, are thus more or less effectually swept by the current which at the same time blows from the windows across the room; but this lateral spread of the air currents will not reach far into a corner, so that windows in the side walls, as near the end walls as possible, are a necessity for efficient ventilation. It may be observed, also, that the lateral spread of the air is checked by any sharp change of direction of the movement, so that the rounding of the internal angles of floors, walls and ceilings, now universal in hospital construction, materially assists the thorough aeration of the room, besides facilitating the removal of dust.

The length of the ward being thus determined by the number of beds required on each side, the standard of spacing adopted, and the reservation of the necessary distance between the bed at each end of the row and the corner of the room, the width is next to be considered. Here precedents vary greatly, and the conditions to be fulfilled may vary also. Supposing the beds, with their coverings, to measure six and one-half feet in length, and the head of each to be set one foot from the wall, to allow a free circulation of air around it, the space required for the two rows of beds will be fifteen feet. For the movement of nurses and attendants between the rows of beds a passageway seven feet wide is sufficient, giving a total width of twenty-two feet for the ward. This is generally accepted as the minimum satisfactory width for wards of ordinary hospitals. In practice, it is very frequently exceeded, for various reasons. Where the ward contains more than eighteen or twenty beds, the necessary passing through the central aisle is so much increased that it may be desirable to allow a foot or two of extra width to accommodate it; and accident wards, where there is much passing to and fro of stretchers, may also need a wider central aisle. An argument for wide aisles which is, perhaps, given more credit than it deserves, is that medical tradition requires that each patient in a hospital ward shall have to himself a certain number of cubic feet of space, from twelve or fifteen hundred to two or three thousand, according to the authority followed. In former days, when artificial ventilation was imperfectly understood, and, even where it was attempted, the means available for securing the aeration of a large room were feeble, and when hospital wards usually had windows only on one side, the provision of a considerable volume of air for each patient, by diluting the atmospheric pollution which it was impossible to remove entirely, undoubtedly lessened the risk to the patients; but at this time, when every hospital ward has windows on the two opposite sides, at least, and is swept night and day by streams of fresh out-door air, supplemented by currents directed by powerful fans, too great cubic capacity, by which the currents are diffused and weakened, may be a detriment, and a serious one, to the efficient aeration of the room. There is a story of a hospital in India, which was built from the directions of medical officers at a distance. One of the stipulations that they made was that a certain number of cubic feet of air-space should be provided for each bed; but they omitted to limit the height of the wards. The hospital was built according to the agreement; but the contractor had found it to his advantage to gain cubic capacity by making the rooms of preternatural height; and the hospital authorities discovered, on taking possession of their building, that if the floors of the wards were covered with beds, placed close together, with no passages between them, there would still be air space enough above them to comply with the specification, although the hygienic conditions would, of course, be otherwise intolerable.

In our case, if the beds are given the minimum spacing of eight feet from center to center, and the height of the ward is restricted to twelve feet, which is the limit in many hospitals, it follows that, in order to give each bed fifteen hundred cubic feet of space, which, under the old rules, would be a very moderate allowance, the distance from the wall to the center of the ward must be something over fifteen and one-half feet, giving a total width to the ward of more than thirty-one feet. Whether so great a width would be advantageous to the patients or not will be considered later; but it is obvious, at least, that the distribution of air-currents and sunlight in the ward may often be a matter of quite as much importance as mere cubic capacity, and that these should be regarded in the final determination of dimensions.

Where a hospital is attached to a medical school, or is used for the instruction of students, it is common to make the central passageway in the wards ten feet or more in width, so as to accommodate a group of observers around the foot of the bed during clinical lectures, without obstructing the service of the ward; and, in many hospitals, ventilation flues, sometimes with open fireplaces attached to them, are built in the middle of each ward, so that the central passageway must be made wide enough to allow beds to be carried past on each side of them. So far as accommodation for clinics is concerned, it is, perhaps, necessary in some cases to provide room for a considerable number of students in the passageway; but the central ventilation flue hardly has, for hospital purposes, sufficient virtue to justify increasing the width of the ward to accommodate it.

(To be continued.)

STATE FIRE PROTECTION

BY F. W. FITZPATRICK

THE fire record for 1904 was appalling. Nearly 7,000 lives and over $230,000,000 in property were blotted out of existence. Besides this, and only considering the money loss, we wasted over $500,000,000 in insurance—that is, that amount was paid out for which there was no return in indemnities—and spent probably over $200,000,000 more for the maintenance of fire departments, sufficient water pressure, etc., in an effort to combat the progress of fires, to cure the evil when it is so very easy to *prevent* it. Fire really constitutes the most serious tax assessed against us. And the direct loss it entails is unlike most losses that are really but exchanges of property, for what usually means a loss to one is a gain to some one else or many others, but with fire the loss is definite and final, smoke is all that remains.

This year's record bids fair to be a serious one, too. For ten days in February last I kept an accurate record of every fire in the country. Our usual records are made up of fire department reports, insurance returns and such data, that does not by any means represent or tell all the story. I prepared an elaborate scheme to get at all the information during that period and am reasonably sure that I succeeded. I kept that machinery at work for ten days only simply because I deemed that a sufficient test and the cost of making it was about all that an enthusiastic individual not in the millionaire class could stand. During those ten days there were 2,275 fires, involving a total loss of $14,809,800! On one of those days, February 23d, there were 165 fires, with a loss of $2,015,700. Think of it, the ten days averaged nearly a million and a half dollars a day! True, some pretty heavy fires occurred during that period, the Hot Springs, the Boston docks and the New Orleans terminal. I had no prophetic knowledge of those fires at the time I started keeping the record. That awful average has not continued steadily, Heaven be praised! But for last year it was $630,000 a day. Who tells us that from now to the end of the year there may not be fires destructive enough to make our general average the million and a half it was during that test period?

What are we doing to prevent it? We are spending millions for water and fire departments and other alleviations, but blessed little for prevention. Why, there are scarce 3,000 fireproof buildings in the entire country, buildings that justly merit the appellation of being even moderately fireproof. What is directly wasted in fires, our actual loss in money, would be more than sufficient to make every building that is erected in the year absolutely fireproof in all its parts, fittings and furnishings. And our total direct and indirect loss by fire represents just about what we spend every year in new buildings!

We Americans boast of our progress and our leadership among the peoples of the earth, and, I grant you, with justice in a great many respects, but in a great many other respects we are deplorably slow, behind the times, fossilized. For instance, we knew that the Australian ballot system was the proper way of voting, yet every other civilized nation on earth adopted that system before we did. It has been amply demonstrated to us that postal savings banks under government control are an incalculable boon to the people, yet our legislators have listened to the cooing of our private bankers, and postal savings banks seem as far off as ever they were, though all the countries that amount to anything have them in successful operation. So with fire. We know that building of wood is no longer economy, sensible, rapid, or anything else that would recommend it to a sane man, yet we keep right on using the most inflammable of materials for the construction of our homes, our places of business, and daily exposing the lives of those we hold dear, our own and our property to the imminent danger of destruction. It is as if a man would take all his family and earthly belongings in a wagon and promenade up and down a busy railroad track declaring that he liked the exercise of dodging trains!

There comes a time, spite of the theory of individual rights and all that sort of thing, when for the protection of the many against the insanity of a comparative few, it becomes the duty of the State to step in and say how things shall be done. That duty is recognized by some cities that have passed moderately wise building laws and regulations and enforced them more or less rigorously. But there are still cities lagging behind, cities, even crowded cities, where you can build anything you care to, where it becomes a case of competition among builders as to who can erect the shoddiest construction that will stand up and secure rental returns for a few years. There are goodly sized towns where there is not only no building regulation, but where seemingly the authorities deem that any attempt at regulation of building would be detrimental to the welfare of the place. And it is these small places of today that aspire to and often become the cities of tomorrow. Chicago, New York, Baltimore, all the great cities of our continent, have suffered and are suffering grievously for the sins of their older citizens. The regulations in most of those larger cities are fair, as far as new buildings are concerned, but there are the hoary old fire-traps, built when regulations were not so severe, a constant menace and danger.

Recognizing the folly of lukewarm regulation, the criminality of the absolute absence of regulation and the foolish indifference of the great masses of our people, it has been deemed wise to endeavor to secure State legislation upon the subject. A concerted and strong movement is being made to have all the States adopt a uniform code of building regulations, something quite general in terms, divested of any technical verbiage, brief, though all comprehensive, that will work no particular hardship upon any individual and that will secure a better class of buildings throughout the entire country, a lessening of our horrible fire losses, a prevention rather than any attempted cure of the evil. We are not endeavoring to have any special serum or anti-toxin ready at hand in an attempt to save the patient when once affected, but we are endeavoring to establish a sane quarantine, that will keep out a low, degraded class of building, dangerous to the community and the individual.

With that purpose in view, the following rough draft

of a bill has been made and at the proper time will be urged for adoption by every legislature in the land.

A BILL TO REGULATE THE CONSTRUCTION OF BUILDINGS IN CITIES, TOWNS AND OTHER SETTLEMENTS IN THE STATE OF .....

Whereas; The loss of life and of property, both public and private, through fires, having reached appalling proportions, and there being danger that such losses will continue increasing as years go on, by reason of the careless, if not criminal mode of construction of buildings that now generally obtains, and very largely because the people still labor under the mistaken impression that wood and other inflammable materials constitute economical means of cnstruction, and that in most cities and towns there are not sufficiently stringent municipal regulations on that head, or else through negligence or other causes such regulations as do exist are not rigorously enforced, it has become expedient and necessary that the State interfere for the protection of the lives and property of its people. Therefore,

Be it enacted by the Senate and House of Representatives of the State of .....; That upon the date of approval of this bill the following regulations anent building will become operative throughout the State, and that all parties thereafter constructing buildings in contravention of the spirit and wording of this Act shall be guilty of a misdemeanor and held punishable for such offenses as herein provided.

1—In no city or town, village, settlement or aggregation of buildings adjacent but owned by different individuals, shall there be built a frame building of any description more than three stories high, or forty feet above the ground.

2—If such frame structures be built up solidly or continuously upon a block, or along any street or highway, there shall be dividing walls, without any openings in the same, and carried up to at least two feet above the roof line, at least every sixty feet in width and to the full depth of the buildings. Such walls to be at least two bricks thick or their equivalent in fireproof tile, stone, concrete or other incombustible material. And in such continuous buildings, where there are more than four such divided spaces, then the roofs shall be of metal or slate or other spark-proof material.

3—Detached houses and other buildings not higher than three stories and built entirely of wood, or with wooden outer walls and roofs, must be at least ten feet apart. If built of brick walls and uninflammable roofs, residences and other buildings may be five feet apart, but the windows in all such walls must not be opposite each other; and if windows be further provided with automatically closing fire shutters or wired glass sash such adjacent walls may be even closer together. The same regulation as to width between buildings is to govern widths of light courts or other openings in the buildings themselves when the solid parts of such buildings are thirty feet wide and over.

4—If a 3-story wooden building is to be used as a tenement, school or hotel, or where more than forty people are housed on a ground space equivalent to 1,500 square feet or less, there shall be two stairways in separate parts of the building and giving directly upon exits from the building, and such stairs shall be accessible from each story and from all parts of the building.

5—In all wooden churches, halls and other places of occasional public assemblage, the auditorium floor proper shall not be over one story, or eighteen feet above the ground, and there shall be a clear and direct stairway of at least six feet width, giving directly upon the main exit to the street from such auditorium floor. If there is a gallery in such hall or church then there must be a separate stairway of at least four feet width giving directly upon the street, and in no case shall such hall or church, built of wood, wood walls, floors and roofs, accommodate more than 200 people in the gallery and 700 on the auditorium floor, nor shall there be more than one gallery in such building.

6—Churches and halls of greater capacity must be constructed as to walls, floors and roof, of uninflammable material, and all stairs must be of iron or other uninflammable material, and the main or auditorium floor must not be over six feet from the ground. In all such halls or churches there shall be separate and direct exits of at least four feet width, one for every 300 people on the auditorium floor and independent fire proof stairways for each gallery and the equivalent of five feet in width per 300 people accommodated, such gallery stairs giving directly to the street and inclosed in fireproof walls with doors only from the gallery served. Besides this there shall be an outer fire exit with an iron stair at least three feet wide, provided with metal handrails and so arranged as not to cross or be exposed to flame from any window or door in the wall, one such stairway to every gallery over twenty feet from the ground.

7—Hotels, shops or other buildings housing many people may be five stories high or seventy feet if constructed of brick or other uninflammable walls and spark proof roofs and wooden floor joists and partitions, but with the air spaces between all joists and studding cut off by bricks, tiles, metal or boards the full size of the square of the air spaces, and that all the plastering be done upon wire lath or expanded metal and that there be tanks and water supply, adequate hose and other necessary precautions taken to minimize the danger of spread of fire. But in all such buildings of five stories in height there shall be a stairway from the street level to the top story inclosed in a fireproof wall, the stairs of uninflammable material and absolutely cut off from the basement by fireproof flooring and giving directly to an exit on the street and accessible from every story by an automatically closing fireproof door opening outward, at the landings of the said stair. And in all such buildings there must be brick or other fireproof walls cutting up the floor area in sections of not over 10,000 square feet, and if openings are desired in such walls they shall be protected with automatically closing fireproof doors. All such buildings shall also have, far removed from the aforementioned stairway a fire escape of metal and of approved construction, from the roof to the ground and accessible from open hall-ways at every story.

8—Warehouses or other such buildings, or workshops may be six stories high or eighty feet provided they be enclosed in fireproof walls and roof and their interior structure be of what is known as "mill construction," and if served by enclosed fireproof stairs as described in section 7, and the floor area similarly cut up into sections of not to exceed 10,000 square feet by fire walls and automatically closing fire doors.

9—In all such buildings described in sections 7 and 8 there shall be stairs of the character specified and at least five feet wide in the clear, from story to story, proportioned per 300 employes or people usually or at any time present in such building. And there shall be no open elevator or other wells or skylight shafts or shafting spaces open vertically through the floors. All such necessary openings in the floors must be enclosed in continuous fireproof walls with automatically closing doors thereto or wired glass in metal sash.

10—Buildings of semi-fireproof construction, that is fireproof outer walls and roof, floor construction of wide span concrete or tile and uninflammable partitions, but with wood or other combustible floor covering, doors, windows and "finish" generally, though without any open spaces back of such woodwork, and all such woodwork coated with some form of approved fire-retarding paint, may be eight stories or 100 feet high, provided the regulations prescribed about stairs and elevators and fire escapes in former sections be likewise applied to this section, though there may be light wells and other openings vertically in the floors in buildings serving purposes of stores or workshops. In all such structures ample provision of hose and fire apparatus, power for pumps, etc., must be made and constantly kept ready for service.

11—Buildings of absolutely fireproof construction, that is, of walls and roof and all exposed structural parts of fire and waterproof material, and all structural steel members properly encased in cement and potected with at least two inches of brick, fireproof tile, concrete (other than cinder concrete) or other fireproof materials, and the floor construction of flat arches not over eight feet spans or segmental arches of not over sixteen feet spans and of brick or fireproof clay tile or of reinforced concrete of not less than six inches thick and of no weaker amalgamation than one part cement to two parts sand to three parts crushed stone or brick or tile or slag (no cinders) and all the floor coverings, the interior "finish" and the doors and sash and other trimming of the building of uninflammable material, and the exposed windows on alleys or courts covered with fire shutters or glazed with wire glass in metal

sash and the stairs and elevators protected by inclosures and doors as provided in other sections, may be of any height desired or as regulated by the municipality; provided that in all such buildings over 100 feet high there shall be maintained tanks on the roof with water in sufficient quantity with necessary hose, pumps in *constant readiness* and other such individual protection as the fire warden shall deem necessary for that building.

12—Further, the State fire warden may issue special permits or dispensations from these requirements to builders of grain elevators or other such special buildings, to erect them of greater height than the classes above described for buildings built in the different modes of construction, provided he deem them of not extra danger to the surroundings or creating any extra hazard there where they are proposed, and such buildings must be at least 500 feet removed from any other structure and in no way directly endangering any other party's property. And such special buildings must not be used for manufacturing or other purposes than storage only and where not over ten employes are at any time at work upon any one of the upper stories.

13—The fire warden of the State shall be the officer empowered to enforce these regulations. And the governor shall appoint such assistants as the said fire warden may require, who shall be State inspectors of buildings (and whose salaries and the maintenance of suitable offices, providing of stationery, furniture, traveling and other necessary expenses shall be paid from the general fund), and the duties of said inspectors shall be to see that these regulations are enforced throughout the State and to them are hereby given full police powers to enforce the said regulations and to bring offenders there against before the courts of proper jurisdiction.

14—The owner or owners of any building, structure, wall, flooring or any part thereof, where anything in violation of these regulations shall be placed or shall exist, and any architect, builder, plumber, carpenter, mason or other craftsman or laborer who may be employed or assist in the commission of any such violation, and all persons who shall violaate any of the provisions of these regulations, or fail to comply therewith, or any requirement thereof, or shall build in violation of any certificate or permit issued thereunder, shall for every and each violation or non-compliance be guilty of a misdemeanor and upon conviction thereof shall be fined not less than $5.00 nor shall the punishment for the first offense be more than a fine of $500 or imprisonment for six months, but any subsequent offense or violation of these regulations shall make one amenable to punishment at the discretion of the court.

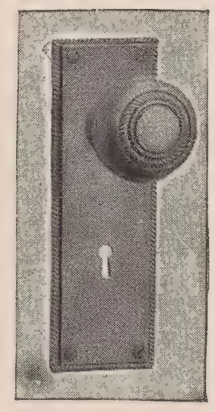
IN the restoration of the senate chamber of the old State house at Annapolis the architects Baldwin and Pennington will be advised by a sub-committee selected from the historical societies of the state.

MANUEL MENDOZA, a Spanish architect, has been awarded the prize for the best plans for the new parliament building for Uruguay. The contest was international in its scope. Mr. Mendoza has charge of the construction.

ARTISTIC HARDWARE*—Continued.

LATER work upon the same lines showed a real development, and it continued to be made by some firms, and with increasing success, down almost to the present decade.

But meanwhile a much more comprehensive movement had been begun, and it had been begun under happier auspices. That is to say, it was marked by the coöperation of artistic designers and of manufacturers who were willing to take trouble and to spend money in securing artistic results. It was about 1883 that the Romanesque revival, stimulated by the success and vogue of the works of Richardson, had begun to make its way over the country, and had enlisted the active-minded and progressive young architects, the successors of those who, in the previous decade, had given themselves to the advancement of Victorian Gothic, and in some cases the same persons. The Romanesque had taken almost undisputed possession of the West, and along with those of its practitioners, who followed it simply because it was the fashion, there were others who believed in it and who were earnest in following out its possibilities. Chicago was the center of this cult in the West, and several of the most capable of the designers of Chicago became interested in the efforts to produce much more artistic work in cast metal than had been produced heretofore. Among these were John W. Root, Louis H. Sullivan and W. B. Mundie. Many of the designs procured from them are still current and among the standard products of the company for which they were made. They were so manifestly superior to anything that had been done before in this country that a distinct demand for artistic hardware followed upon the supply of it. The demand thus created soon stimulated other manufacturers to follow the lead thus opened, sometimes through more or less direct imitations of successful designs, more rarely by the same means by which those designs had been produced—that is to say, by the employment of competent designers.



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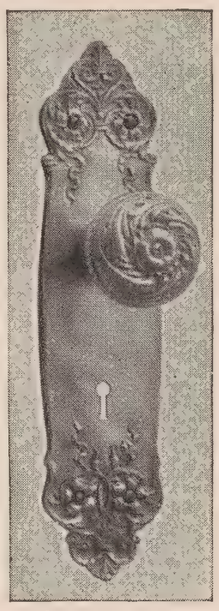
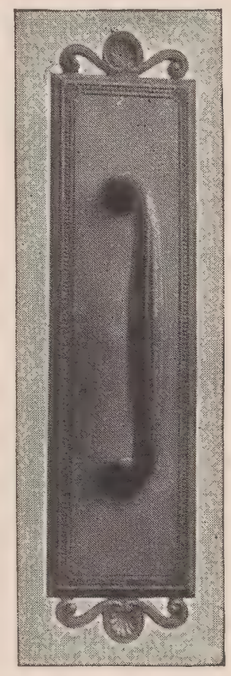


ABOUT 1892

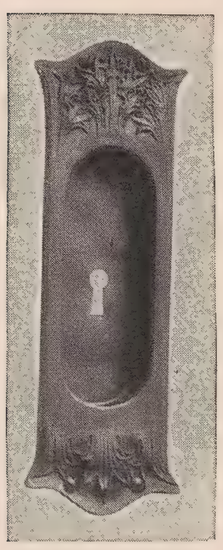
But, although the results of this employment were so gratifying they were not at this stage completely satisfactory. A main charm of artistic handicraft is that in such handicraft the designer is also the artificer. No execution of an architect's drawing by a mere mechanic, never so highly skilled, can replace the attractiveness of the work in which the workman is shaping the creation of his own mind. It is this which distinguishes the stone capitals, the wooden furniture, the metallic grilles and hinges and latches of the best mediæval work from the most successful modern reproductions or imitations. Of course, this method is not directly applicable to modern manufacturing conditions, in which the artistic end must be attained within a predetermined limit of cost. The closest approach to it is made when the designer works in the closest possible connection with the workman; when he does his designing in the factory in which it is to be executed, and acquires by daily contact an intimate, almost intuitive knowledge of the possibilities of the means by which his design is to be reproduced. This is the first condition of progress in industrial art.



ABOUT 1892.

ABOUT 1893.

Moreover, in cast work there is necessary the intervention between the design and the product of a sympathetic and highly skilled artisan in the modeler, whose intelligent coöperation is required for the interpretation of the design. After the casting is produced, hand work is again brought into requisition for the finishing touches. In the work of the highest class, and also, necessarily, of the greatest cost, there is scarcely any limit to the extent to which this finishing work may be carried. When hand chasing is applied by an artistic artisan without restriction of time or money, the result even of a casting is an original work of art. But evidently for the production of such work by modern industrial methods it is necessary that the employer should himself be appreciative of the value of artistic effect.



ABOUT 1890.

*Written at the author's suggestion by the well known architectural critic, Mr. Montgomery Schuyler, of New York, and reproduced by permission from "A History of Architecture in New York," 1898.

*An article forming part of "A Treatise on Locks and Builders' Hardware," by Henry R. Towne, president of the Yale & Towne Manufacturing Company, and past president of the American Society of Mechanical Engineers. John Wiley & Sons, publishers. Price, $3.00. It is the intention of the publishers of the INLAND ARCHITECT to publish other selections from this work. The book is profusely illustrated and contains more than 1,100 pages, 4x6½ inches.

OBITUARY.

FRANK EUGENE KIDDER, architect, engineer and author of works on building, died October 27th last at Denver, aged 46 years. He graduated in 1879 from Maine State College and about that time had completed his first compilation of the "Pocketbook," destined to become a standard work of reference for architects and builders. He studied architecture at Cornell University and the Massachusetts Institute of Technology, and after practical experience in prominent offices located as architect in Boston. Seventeen years ago, from considerations of health, he removed to Denver, where he engaged in practice as architect and consulting engineer. He was a past president of the Colorado Chapter of the American Institute of Architects and an honorable fellow of the A. I. A. To the building public at large he was best known through his published works and writings, prominent among which are his "Building Construction and Superintendence" and "Churches and Chapels." He was esteemed by the community in which he lived for his uprightness of character.

ASSOCIATION NOTES.

KANSAS CITY CHAPTER, A. I. A.

The officers recently elected are: President, Walter C. Root; vice-president, George Carman; secretary, Francis J. Plym; treasurer, George M. Siemens; directors, F. B. Hamilton, Horace La Pierre and J. W. McKecknie.

CINCINNATI CHAPTER, A. I. A.

The election of officers at the annual meeting, October 19th, resulted in the selection of the following: Gustave Drach, president; Harvey E. Hannaford, vice-president; A. O. Elzner, secretary; George W. Rapp, treasurer; Joseph Marty, member of executive committee.

CONNECTICUT CHAPTER, A. I. A.

At the annual meeting held October 19th, the following officers were elected: President, L. W. Robinson, of New Haven; vice-president, George Keller, of Hartford; secretary and treasurer, W. C. Brocklesby, of Hartford; director, Charles O. Whitmore, of Hartford.

SOUTHERN CALIFORNIA CHAPTER, A. I. A.

In connection with the annual meeting a banquet was served, followed by a literary program. The election of officers resulted as follows: President, A. F. Rosenheim; vice-president, John Parkinson; secretary, Fernand Parmentier; treasurer, August Wackerbarth; board of directors, R. B. Young, Octavius Morgan, Frank D. Hudson. The subject of discussion for the evening was a paper on "Reinforced Concrete," by Louis Ritter, of Chicago, and read by W. L. B. Jenney.

TORONTO ARCHITECTURAL EIGHTEEN CLUB.

At the annual meeting held Tuesday, September 26, the following officers were elected: Mr. Henry Sproatt, president; Mr. E. R. Rolph, first vice-president; Mr. J. C. B. Horwood, second vice-president; Mr. C. D. Lennox, third vice-president; Mr. J. P. Hynes, secretary-treasurer. The regular meetings will be held at noon luncheon every Tuesday, special evening meetings being held from time to time as special subjects arise.

CHICAGO ARCHITECTURAL CLUB.

The meeting of October 16 was of exceptional interest. The feature of the evening was a reading by Louis H. Sullivan from his own writings entitled "Kindergarten Chats." These chats, Mr. Sullivan stated, embodied the experience of his life. They record the development of an architectural student after he has finished with the schools. In answering his questions Mr. Sullivan's well known views on architectural education are elaborated. Those in attendance were greatly interested both in the reader's matter and manner. On the Monday following Henry G. Foreman spoke of "The Outer Belt Park System for Chicago.

NATIONAL SCULPTURE SOCIETY.

The beginning of the society's activity was marked by an exhibition of portraits in the society's room, 215 West Fifty-seventh street, from Wednesday, November 8th, to Saturday, November 18, 1905. The exhibition was open to all members of the society and their friends. The sculptor members of the society were requested to contribute to this exhibition examples of their work in portraiture. Works that in any way were classed as portraits, busts, single or in groups, reliefs, medals, etc., were admissible. A prominent feature of the exhibition was the special competition for the prizes offered by Mr. J. Q. A. Ward and Mr. I. Wyman Drummond.

COLORADO CHAPTER, A. I. A.

The Chapter expresses its sorrow for the loss of one of its most prominent members in the following memorial:

We, the Colorado Chapter of the American Institute of Architects, contemplate with pride the life, and in genuine sorrow the death, of one of our most prominent members, Mr. Frank Eugene Kidder. Mr. Kidder was born in Bangor, Maine, on November 3, 1859, and died at Denver, Colo., October 27, 1905, in the prime of his manhood, at a time when his life's labors were developing into fruitage, and there was a call for further service at his hands. A graduate from Maine State College in 1879, whence he received the degrees of C. E. and Ph. D.; a student in architecture at Cornell University, and the Massachusetts Institute of Technology, 1878-80; assistant in the office of Ware and Van Brunt, and prominent offices in New York City; experience as a practicing architect in Boston and Denver; he was well equipped to become the author of various text books which are perhaps the crowning achievements of his professional life. His "Churches and Chapels", "Building Construction and Superintendence" and "Roof Trusses" are valuable additions to the library of an architect, and every student and practitioner in building lines knows of "Kidder's Architect and Builders' Pocket Book." Mr. Kidder had been a practicing architect and consulting engineer in Denver for seventeen years, and was highly thought of generally by the profession. He was an active member of the Colorado Chapter of the American Institute of Architects, and its president during the years 1903 and 1904, and an honorable Fellow of the A. I. A. He was a kindly Christian gentleman, and his good offices will be sadly missed in the immediate community in which he lived and labored. In sincere friendship and love, we inscribe upon the records of our Chapter these inadequate notes in his memory, and extend to his bereaved family our heartfelt sympathies.

W. E. Fisher,
President Colorado Chapter, A. I. A.

Attest:
William Cowe, *Secretary.*

OUR ILLUSTRATIONS.

Station for Baltimore & Ohio Railroad, Youngstown, Ohio.

Station for Delaware & Lackawanna Railroad, New York City.

Kenwood church, Kenwood, Chicago, John S. Woollacott, architect.

Residence for L. Wolff, Jr., Chicago, Richard E. Schmidt, architect.

Residence for Mrs. L. A. Todd, Oak Park, Ill., E. E. Roberts, architect.

The Illinois apartment building, Kansas City, Mo.; Root & Siemens, architects.

Residence for W. W. Sylvester, Kansas City, Mo., Root & Siemens, architects.

Ball Room, St. Louis, Mauran, Russell & Garden, architects. Three full page views are shown.

The Municipal Building for the District of Columbia, Cope & Stewardson, architects, Philadelphia.

The Shepard School Building, St. Louis, William B. Ittner, commissioner of school buildings, architect.

Residence for F. N. Corbin, Kenilworth, Ill., George W. Maher, architect. Two exterior views, an interior and plan are shown.

First National Bank building, Chicago, D. H. Burnham & Co., architects. The following views are shown: General Exterior; Main Stairway to Bank Floor; Landing of Main Stairway; Interior View, Main Bank Floor; View in President's Room.

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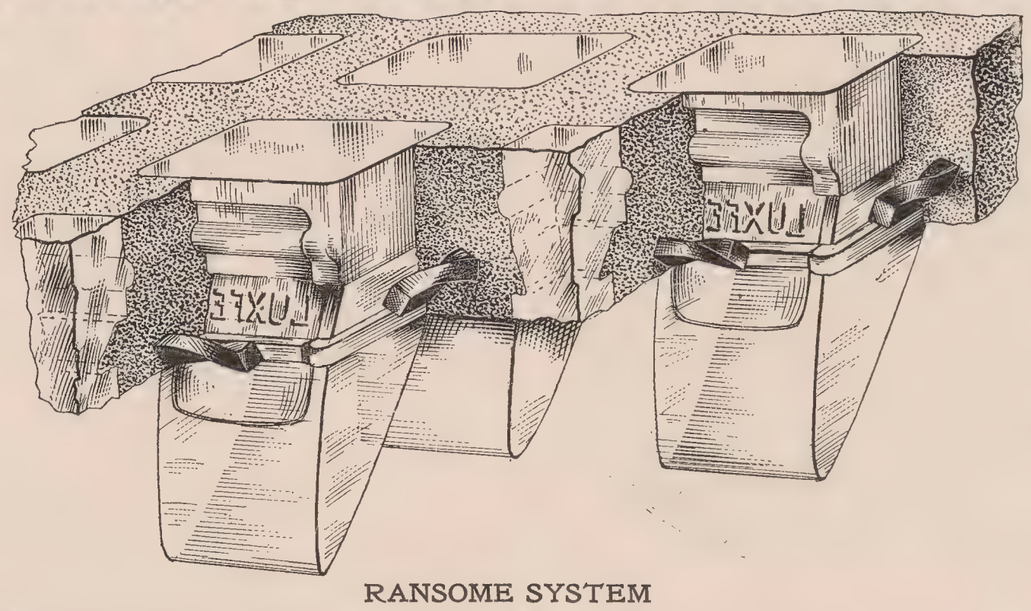

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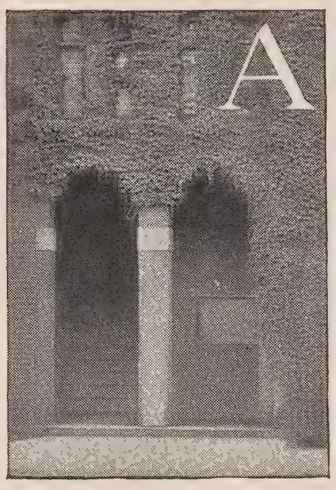

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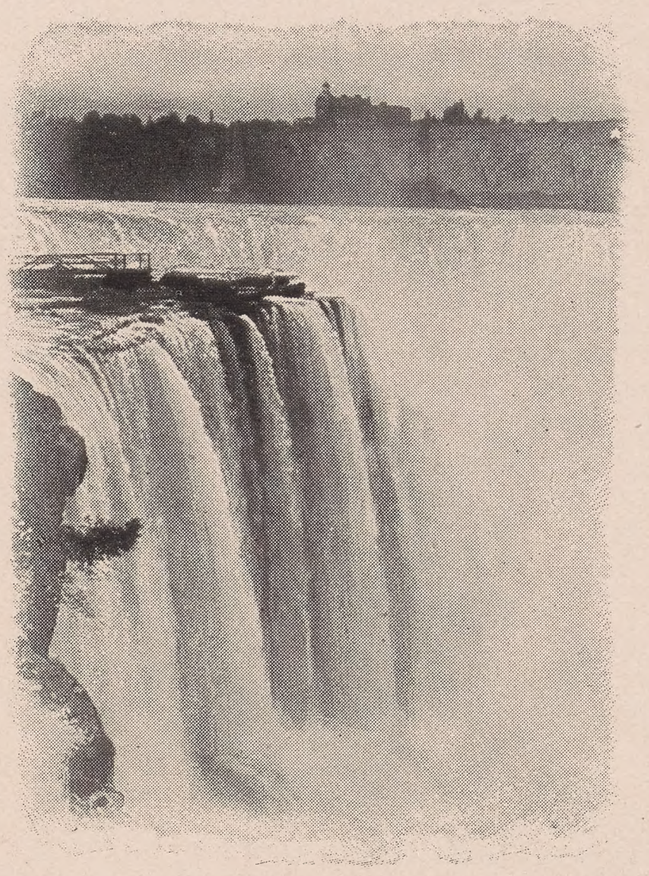

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PROPOSED TESTS OF STRUCTURAL MATERIALS.

A STATEMENT has been issued as follows regarding the proposed investigations of the fire resisting qualities of cement mortars and concretes under the joint direction of the American Society of Civil Engineers, American Society of Testing Materials, Joint Committee on Concrete and Reinforced Concrete, National Association of Cement Users, National Board of Fire Underwriters, National Fire Protection Association, Association of American Portland Cement Manufacturers, Concrete Block Machine Manufacturers' Association and the United States Geological Survey:

The question of the fire resisting qualities of structures in which cement is used as a binder, has been claiming the attention of all constructors for many years, but more particularly since the Baltimore fire, with some experimental work which has given useful information on the subject.

The program for the investigation of fuels by the United States Geological Survey includes tests of the fire resisting qualities of cement mortars and concretes; it has been proposed to carry on similar studies under the joint direction of the National Fire Protection Association and the National Board of Fire Underwriters at the Underwriters' Laboratories in Chicago. The joint committee on concrete and reinforced concrete of the American Society of Civil Engineers and affiliated societies, the National Association of Cement Users, the Assosiation of American Portland Cement Manufacturers and the Concrete Block Machine Manufacturers' Association also contemplated making similar investigations.

In order that these tests should be as exhaustive as possible it was deemed inadvisable for the various organizations to proceed on independent lines, but to unite in a joint investigation.

In response to a call by Mr. Richard L. Humphrey, representatives of the various organizations met at the House of the American Society of Civil Engineers, No. 220 West Fifty-seventh street, New York, on Tuesday, September 5, 1905, at 10 a. m.

There were present representatives of the American Society of Civil Engineers, American Society of Testing Materials, National Board of Fire Underwriters, National Fire Protection Association, National Association of Cement Users, Association of American Portland Cement Manufacturers, Concrete Block Machine Manufacturers' Association and the United States Geological Survey.

The object of the meeting was explained and after some discussion it was decided to organize a committee for the joint investigation of the fire resisting properties of cement mortars and concretes by the above named societies.

The committee organized by the election of Mr. Richard L. Humphrey, chairman, and Mr. Robert W. Lesley, secretary pro tem.

The first series of tests will be made on sand mortars, no facing being used in the manufacture of the block, which will be of a standard size, 9x12x24.

Another series will be made, using dry, medium and very wet mixture, using three grades of mortars for each condition, viz.: rich, medium and lean.

A series of blocks will be made under the direction of the committee of the Concrete Block Manufacturers' Association, in accordance with common practice.

It is proposed to build a test oven. Three blocks of each series will be submitted to the test, two with the face toward the inside of the furnace and one with the back of the block facing the inside of the furnace. The blocks are to be laid in lime mortar, and four three-inch diameter Bunsen burner jets with a fire brick baffle will be used for heating the furnace. It is proposed to raise, at a uniform rate, the temperature of the test oven to a temperature of 1800 degrees Fahrenheit during a period of one and one-half hours and maintain this temperature for one-half hour. It is then proposed to turn two streams of water of twenty pounds pressure at the nozzle, against the inner walls of the test chamber from points diagonally opposite each other for a period of five minutes.

At the conclusion of the test, wherever possible, it is the intention to make a determination of the strength and other physical properties.

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Arrive New York at 9.30 a. m.	Arrive Chicago at 8.30 a. m.

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THE
CUTLER MAILING SYSTEM

AS INSTALLED IN THE
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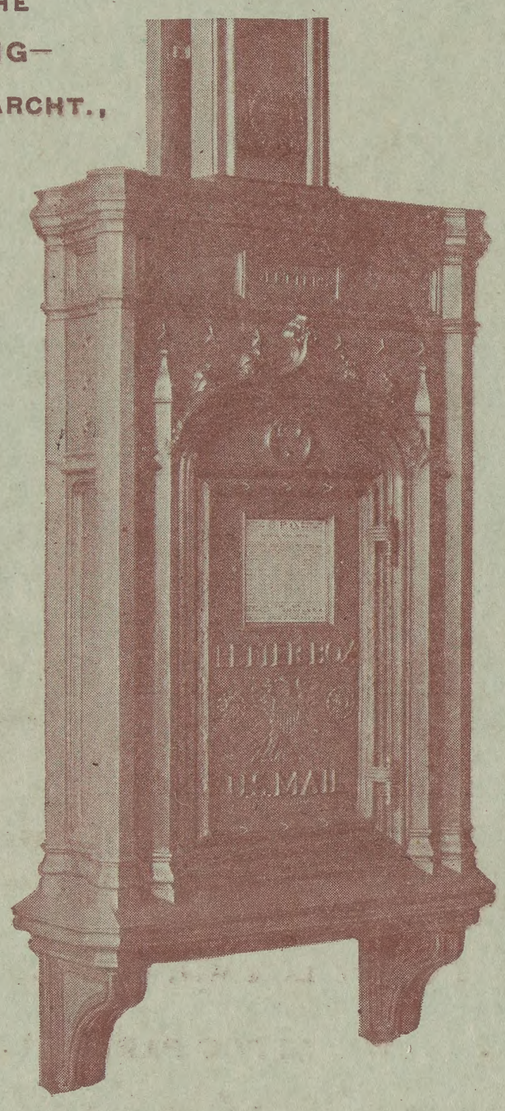
FRANCIS H. KIMBALL, ARCHT.,



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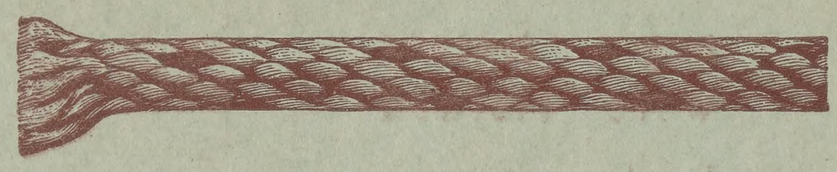

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beating against a front door will soon cause it to become white and weather-beaten, unless the woodwork is protected by

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